COMMUNICATING BIOPROSPECTING INFORMATION TO INDIGENOUS COMMUNITIES: INSIGHTS FROM THE EXPERTS

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Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

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ABSTRACT

Bioprospecting is a multi-billion dollar life-science industry which can benefit from the input of indigenous peoples' natural resources and traditional knowledge. So that indigenous peoples can fully participate in decision making on bioprospecting, it is necessary to build the capacity and awareness of indigenous communities. In 2004, information from an international forum, *Indigenous Knowledge and Bioprospecting,* was to be communicated to indigenous communities. To understand the likely value and effectiveness of this, I interviewed experts at the conference for their views on the bioprospecting knowledge of particular groups of indigenous peoples, the importance of communicating information from this event to indigenous communities and the likely effectiveness of a particular communication tool for this purpose. The experts believed that the indigenous peoples considered have either poor or variable knowledge of bioprospecting and it was seen as important by all experts to share information from the *Indigenous Knowledge and Bioprospecting* forum to indigenous communities. All experts also supported using a DVD documentary about the conference to communicate information from the event to indigenous communities.

CONTENTS

CHAPTER 1 - INTRODUCTION

Background to the Study

'Bioprospecting' refers to the exploration of nature for valuable new products (Artuso, 2002, p. 1355). It is a modern name for one of the oldest and most important industries in human history, as people of every culture have always prospected their environments for useful resources for food, shelter, medicines and environmental and this activity has played a central role in human development. Traditionally based on the trial and error search for useful products from land plants and animals, bioprospecting methods have undergone dramatic transformation over the past few decades and now bear little resemblance to their original form. Today, bioprospecting involves the sampling of resources from diverse ecosystems - including deep sea, coral reef, desert, arctic and forest environments - and the application of advanced technologies to manipulate living organisms and their components. The practice is now used primarily to discover useful biochemicals and genetic material, and these 'bioproducts' contribute to an ever-expanding range of life science industries, including the pharmaceutical, biotechnology, seed, crop protection, horticulture, botanical medicine, cosmetic and personal care and food and beverage sectors (Laird, 2002, p. 243).

The economic contribution of bioproducts to world markets is substantial, exceeding US$200 billion in 2002 (Jones, 2002). However, bioprospecting is a high risk, high cost enterprise; only one in 10,000 biological samples shows promising activity, and the development of a newly discovered bioactive compound into a commercial product costs around US$500 million and takes between 10 to 18 years (Laird, 2002, p. 249). Since bioprospecting requires the input of considerable financial and technological resources, its investors are mostly large companies based in Europe, Japan and the United States. Ironically, these industrialised northern nations are relatively poor in biological diversity and bioprospectors' preference for sampling areas of high biodiversity leads them to explore environments such as tropical rainforests in developing southern nations. Due to these regions also being home to the world's greatest diversity of indigenous cultures, bioprospecting has often been

carried out within the territories of indigenous peoples, and involved the use of indigenous peoples' natural resources and biodiversity knowledge.

Indigenous peoples' resources and knowledge have contributed significantly to world markets, but their use in bioprospecting has seldom translated into benefits for indigenous peoples. Bioprospectors 'discovering' valuable resources on indigenous lands with the aid of traditional knowledge have typically claimed ownership of both the biological material and the information regarding its use, and failed to acknowledge or compensate contributing indigenous communities. Such 'biopiracy' is not new but arguments for its prevention have been voiced increasingly strongly in recent times: indigenous peoples have demanded fairness in bioprospecting; bioprospectors have realised the importance of ensuring that their research involving indigenous communities is more firmly based on ethical principles; and fast species extinction rates have prompted conservationists to call for the guardians of biodiversity - who are largely indigenous peoples - to be compensated for its non-destructive use. Combined, these factors have led to the introduction of measures to ensure equity for indigenous peoples in bioprospecting.

The most significant of these is the 1992 United Nations Convention on Biological Diversity or CBD, which was designed to alleviate the loss of biodiversity on our planet and is now ratified by more than 188 countries (Moran, 2000, p. 132). The CBD provides a framework for 'fair and equitable' bioprospecting by requiring its member nations to develop legislation to regulate access to the biodiversity within their borders and the fair sharing of benefits from its use. CBD signatories must also protect the rights of their indigenous inhabitants over biological resources and knowledge by improving or replacing their active intellectual property rights legislation. Both types of legislation - access and benefit sharing (ABS) and intellectual property rights (IPR) - affect bioprospecting contracts, which are legally binding agreements between the users and providers of biodiversity, and arguably the most important tool for realising the admirable objectives of the CBD in relation to indigenous peoples' rights in bioprospecting.

Despite its commendable 'spirit', however, the CBD has not guaranteed the protection of indigenous peoples' interests in bioprospecting. This is largely

because indigenous peoples are not full and effective participants in either the development of national ABS and IPR legislation, or the negotiation of bioprospecting contracts. It is well known that for ABS or IPR legislation to be effective, it must be developed with the full involvement of all those who will be affected by it, including indigenous peoples. Equally, for bioprospecting contracts to yield 'fair and equitable' deals for indigenous communities, indigenous peoples need to be actively engaged in the negotiation of these agreements. The problem then, is that indigenous peoples involved in the development of legislation and the negotiation of contracts which affect their rights in bioprospecting are in a position of considerable disadvantage compared to their well-resourced Western counterparts, who have traditionally dominated these processes. In particular, they lack the scientific, legal and commercial knowledge required for informed decision-making on bioprospecting (Laird, 2002, p. 419).

Building the capacity of indigenous communities to allow them to participate on an equal footing with other bioprospecting stakeholders requires raising their awareness of bioprospecting issues. This theory has been translated into practice, in the form of on-the-ground programs involving the communication of bioprospecting information to indigenous communities, on a number of occasions. Such programs have been instigated by both bioprospectors, who are obliged to undertake this task in order to obtain prior informed consent (PIC) from communities before accessing their resources and knowledge, and by governments and other authorities, who have worked towards raising community awareness of biodiversity related issues. They have employed diverse approaches and tools to communicate bioprospecting and biodiversity related information to the target groups, contributed to the ability of these communities to make informed decisions on bioprospecting, and provided important lessons about undertaking such communications.

However, much is yet to be achieved in terms of both meeting indigenous communities' bioprospecting information needs, and learning how best to accomplish this. An opportunity to further our collective knowledge in this field arose in the form of an international conference on *Indigenous Knowledge and Bioprospecting*, from which information was communicated to indigenous communities. The event, held in Sydney in 2004, was the first forum in Australia

for indigenous peoples, scientists, and law-makers to consult about bioprospecting and indigenous peoples issues and the first of its kind internationally to pitch discussions at the community level. It hosted presenters and participants of diverse nationalities, cultural backgrounds and disciplines, and conference organisers hoped that the dialogue established at the forum would help to identify 'practical social and economic pathways for the development of indigenous communities and the potential of their own... knowledge' (Jones, 2003).

Plans existed to communicate information from the *Indigenous Knowledge and Bioprospecting* forum to different audiences via a range of media and projects, including: a book, a research project to translate issues of the conference into standard education systems, and the creation of an International Centre of Excellence in Indigenous Knowledge and Biodiversity. The most significant of these projects specifically for indigenous community audiences was an audio-visual documentary about the conference, which would be provided in DVD format to groups and communities on request - a plan that was advertised on the conference web site. The forum organisers believed that the DVD documentary would benefit recipient communities in a number of ways; by raising their awareness of the scientific, commercial and spiritual value of their own knowledge, generating 'optimism in the capacity of the community level' to respond to indigenous knowledge and bioprospecting issues, and providing education on particular aspects of bioprospecting (C. Jones, personal communication, 17 May, 2004).

Rationale for this study

The 2004 international *Indigenous Knowledge and Bioprospecting* conference provided an outstanding and exclusive opportunity to investigate the communication of bioprospecting information to indigenous communities, for a number of reasons. First, this conference was a potentially valuable source of information for indigenous communities because its discussions were relevant to indigenous peoples and were to be pitched at the community level, and indigenous representation amongst the presenters was high. Second, organisers of the conference planned not only to disseminate information from the event, but to produce and distribute communications materials specifically designed for indigenous community audiences. Finally, the Sydney location of the conference made the event accessible

to me - an Australian based researcher, and provided an opportunity to access and interview international experts on bioprospecting and indigenous peoples issues, who were expected to be able to offer meaningful insights into the communication of bioprospecting information to indigenous communities.

It was through interviewing experts at the conference that I aimed to gain insights into the likely value and effectiveness of efforts to communicate information from this event to indigenous communities. The research questions of this sub-thesis were therefore:

1) How well informed about bioprospecting are a number of different groups of indigenous peoples and what does this suggest about the level of bioprospecting awareness that is likely to exist amongst indigenous peoples in general?
2) What is the importance of communicating information from the 2004 *Indigenous Knowledge and Bioprospecting* conference to indigenous communities? and
3) How effective is a DVD documentary about the 2004 conference likely to prove as a tool for communicating information from this event to indigenous communities?

Overview of this sub-thesis

In this introductory chapter I have provided a background to this study and outlined the reasons for undertaking this research. In the next chapter, the literature surrounding bioprospecting as it relates to indigenous peoples and the communication of bioprospecting information to indigenous peoples is reviewed. Chapter 3 includes details of the methods used to collect data for this research, and the findings of the research are presented in Chapter 4, and discussed in Chapter 5.

CHAPTER 2 - REVIEW OF RELATED LITERATURE

Introduction

Bioprospecting is a life science industry based on exploring nature for useful new products. It is rapidly evolving, involves extremely diverse activities and stakeholders, and is 'strikingly multidisciplinary and multisectorial' in nature (Laird, 2002, p. xxx). An important topic in today's global forum, bioprospecting is the focus of a vast body of literature that encompasses such expansive and contentious subject areas as biotechnology and the patenting of life forms, sustainable development and capacity-building in developing nations and conservation of the world's remaining biodiversity. A significant proportion of this literature is concerned with the use of indigenous peoples' resources and knowledge in bioprospecting, and with the complex array of scientific, technological, ethical, economic, social, political, and legal issues that surrounds this practice. This chapter does not comprehensively review the literature related to bioprospecting, or to bioprospecting as it affects indigenous peoples. Rather, it aims to provide familiarity with the current thinking surrounding the communication of bioprospecting information to indigenous communities.

Definitions

Bioprospecting

The term 'biodiversity prospecting', usually abbreviated to 'bioprospecting', was first formally defined by Reid et al. (1993, p. 2) as 'the exploration of biodiversity for commercially valuable genetic resources and biochemicals.' However, no standard definition of 'bioprospecting' exists, and many interpretations of the word are found in the literature. These differ importantly in their explanations of: the purpose and products of bioprospecting, the types of resources that bioprospectors explore, the stages of product development to which 'bioprospecting' refers, and whether the practice necessarily involves the use of indigenous knowledge (see Box 1.0 for further details). Additionally, the terms 'biodiscovery' and 'biopiracy' are sometimes used in the literature as synonyms for 'bioprospecting', by authors preferring their more positive and negative connotations, respectively.

Box 1.0 'Bioprospecting' definitions in the literature: points of divergence

Purpose and products of bioprospecting

According to many authors, the purpose of bioprospecting is to discover commercially valuable chemical and genetic resources (see ten Kate, 1995, p. 1; Reid et al., 1993, p. 2; Bioprospecting/Biopiracy, 1994). However, other writers have identified new drugs (see Hayden, 2003, p. 359; Kumar & Tarui, 2003), compounds or chemicals (see Rausser & Small, 2000, p. 2; McGhee, 2003) and genetic material as the sole products of bioprospecting. For others still, the practice aims to discover a much wider range of 'useful' products from nature, which may even include foods (Artuso, 2002, p. 1).

Resources explored by bioprospectors

Most commonly, bioprospecting resources have been considered to be living organisms belonging to any group - namely plant, animal, fungus or micro-organism (Biotechnology and Bioprospecting, 2002) - but alternatively, these have been thought to be only plants (Davis, 1998; Kumar & Tarui, 2003; Hayden, 2003, p.359), plants and animals (World resources institute, n.d.; United Nations Development Programme, 2004), non-human species (Rosenthal, 1997) or species which have not previously been studied (Weiss and Eisner, 1998, p. 482). Whilst some sources have considered only wild species, forest ecosystems, terrestrial environments or the lands of indigenous societies (Davis, 1998) as potential bioprospecting resources (ten Kate, 1995, p. 1), the majority of authors have regarded 'the world's biodiversity' as open to bioprospecting (World resources institute, n.d., IDS Seminar, 2003).

Stages of product development in bioprospecting

'Bioprospecting' has been used, in some instances, to refer only to the initial collection of biological material, but the term has more often been considered to refer to the entire sequence of processes - from the initial collection of biological samples through to marketing - in 'bioproduct' development (Standing Committee on Agriculture, Fisheries and Forestry, 2001).

Indigenous knowledge an essential ingredient?

According to the 'bioprospecting' definitions of Pimbert (1997, p. 422), Davis (1998) and Hayden (2003, p. 359) the search for indigenous peoples' knowledge about living resources is an essential part of bioprospecting. However, most authors have regarded the search for indigenous knowledge to be important but non-essential to bioprospecting (Bioprospecting/Biopiracy, 1994).

This study will adopt a broad definition of 'bioprospecting'; the exploration of nature for valuable new products (Artuso, 2002, p. 1).

Indigenous peoples

The literature also contains many, varied definitions of 'indigenous peoples'. It has been suggested by Brush (1996) that a common theme amongst these definitions is their identification of indigenous peoples as 'culturally distinct groups who have a minority status within modern nation states and who are politically and economically subordinate'. According to Blakeney (1999), the most widely used definition of 'indigenous peoples' is 'those people which, having historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the society now prevailing in those territories or parts of them', and this definition is adopted in this study.

Terms that have been used in preference to, or interchangeably with, 'indigenous peoples' in the literature include 'aboriginals', 'native people', and 'tribal people' (Brush, 1996). However, 'indigenous peoples' is increasingly prevalent in bioprospecting studies, and its alternatives are rarely seen in the most recent literature.

Indigenous communities

'Indigenous communities' have also been defined differently in the literature on a number of occasions, although it is generally accepted that indigenous communities are characterized by groups of people who are bound together culturally, who have been historically differentiated from mainstream populations and who are to a

degree, self-governing (Blakeney, 1999). This study considers indigenous communities to be 'human groups whose social, cultural and economic conditions distinguish them from other sectors of the national community, who are governed totally or partially by their own customs or traditions or special legislation, and who, regardless of their legal status, conserve their own social, economic, cultural and political institutions or parts thereof' (Laird, 2002, p. 180).

Indigenous knowledge

Definitions of 'indigenous knowledge' abound in the literature. Whilst some are 'checklists' of characteristics of indigenous knowledge (Davis, 1998; Jones, 2002; Emery, 2002) an example of a more succinct definition of indigenous knowledge is 'a cumulative body of knowledge, practices and beliefs, evolving by adaptive process and handed down through generations by cultural transmission, about the relationship between living beings (including humans) with one another and with their environment' (Takako, n.d.) and this definition is adopted in this study.

'Cultural knowledge', 'local knowledge', 'folk knowledge' and 'folklore' have also been used in the literature to refer to the intellectual property of indigenous peoples (Blakeney, 1999), but these have all been criticized by some as being too narrow or implying inferiority. In contrast, the very broad term 'indigenous knowledge system' has been used by other authors (see Posey, 1997). 'Traditional knowledge', despite objections that it implies something simple, savage and static, is the term most commonly used in addition to 'indigenous knowledge' in contemporary discourse (Takako, n.d.).

Since both 'indigenous knowledge' and 'traditional knowledge' are broad terms embracing all aspects of cultural heritage, many authors in the bioprospecting field refer to the type of indigenous knowledge that is directly relevant to bioprospectors. The terms 'indigenous biodiversity knowledge', 'traditional environmental knowledge' and 'traditional ecological knowledge' (Jones, 2002; Laird 2002, p. 184) have been used for this purpose. 'Ethnobotanical knowledge' and 'ethnobiological knowledge' also relate to indigenous knowledge in a bioprospecting context; they are used to refer to indigenous botanical and biological knowledge respectively.

Bioprospecting: an overview

The following background information on bioprospecting is well accepted in the literature:

- Humans have prospected nature for food, medicines, shelter, and environmental services since the dawn of civilization (Biotechnology and Bioprospecting, 2002; Hunter and Jones, 2003; Artuso, 2002, p. 1), and bioprospecting has traditionally involved the trial and error search for plants and animals with useful properties.
- Bioprospecting methods underwent dramatic transformation in the late twentieth century due to the biotechnology revolution, and bioprospecting became based on the use of advanced technologies to develop new pharmaceuticals, agricultural and horticultural products, flavourings, fragrances and industrial enzymes from living resources.
- Today bioprospecting is largely conducted by life science companies based in Europe, the United States and Japan, where scientific and technological capacity in the biosciences is centered. Research institutes, universities, botanic gardens and other such organizations are also significant bioprospectors (ten Kate and Laird, 1999; Christie, 1998).
- Bioprospecting is a high-risk, high-cost enterprise; the chance that a randomly selected biological sample will become an ingredient in a final product is about one in four million (Wiess & Eisner, 1998, p. 486), whilst developing a new bioproduct costs between US$230 million and US$600 million (Laird, 2002, p. 249; Biotechnology and Bioprospecting, 2002) and takes between 12 to 18 years (Laird, 2002, p. 249; Special Panel, as cited by Day-Rubenstein & Frisvold, 2001, p. 217).
- Bioprospecting for new chemical compounds is problematic, slow and costly compared with modern methods of chemical synthesis, but natural chemicals are unrivalled in diversity and complexity due to years of refinement through evolution, hence the continued importance of their discovery.
- Successful bioprospecting can yield substantial financial rewards; in 2002 the sales of natural products exceeded US$200 billion (Jones, 2002), and drugs derived from nature alone account for 25-50 percent of the pharmaceutical industry's US$300 billion annual sales (Laird, 2002, p. 247).

> Bioprospecting is an integral part of most life science companies' operations and is expected to increase in importance in the foreseeable future (Laird, 2002, p. 249).

Bioprospecting and indigenous peoples: a review of selected sectors

Bioprospecting, biodiversity and indigenous peoples

Bioprospecting and indigenous peoples unite as the focus of a wealth of studies, virtually every one of which includes some explanation for why relations between bioprospecting and indigenous peoples exist at all. These explanations are based on the logic that bioprospectors, in seeking to maximize their chances of success, often explore biologically rich areas of the world, which tend to be inhabited by indigenous peoples. Authors agree that significant overlaps exist between areas rich in biodiversity and the territories of Indigenous peoples, although they have adopted different approaches to describing and demonstrating this relationship. Most simply, Posey (1997) and Pimbert (1997, p. 417), observed that high biodiversity areas are inhabited by indigenous peoples, whilst Davis (1998), Moran (1997) and Hunter and Jones (2003) described the same pattern by referring to an 'inextricable' link between biodiversity and cultural diversity.

In other instances, authors have not only commented that such 'remarkable' overlaps of biodiversity and cultural diversity exist, but described where these occur. 'The tropics and sub-tropics of Africa, Asia, Latin America and Australia' (Christie, 1998), 'developing tropical countries' (Laird, 2002, p. 7) and 'economically unstable regions' (Wise, 2002) have all been identified as places where high biodiversity and indigenous peoples coincide, whilst in the most specific accounts of where these areas lie, individual countries have been listed as the world's 'biocultural centres', with Indonesia, India, Australia, Mexico, Zaire and Brazil being generally accepted as the top six (Moran, 1997; Toledo, 2001; Takako, n.d.). Despite slightly differing ideas about the location of biocultural 'hotspots', overlaps between rich biodiversity indigenous peoples' territories - along with bioprospectors' preference for exploring rich biodiversity - are universally championed as the reason why relations exist between bioprospectors and indigenous peoples.

However, there is another well accepted reason why bioprospectors explore indigenous peoples' territories: they value indigenous peoples' knowledge of biodiversity. Indigenous peoples have accumulated biodiversity knowledge over millennia of living closely with nature, but it is only recently that this knowledge has come to the attention of Western science. Now, bioprospectors are reportedly 'waking up to' the extent and complexity of indigenous biodiversity knowledge - which has been labeled 'immense', 'rich', 'complex', 'detailed', 'in-depth', 'intricate' and 'specialised' - and to the fact that it far exceeds western biodiversity knowledge (Christie, 1998; Bussman, 2003). These realizations have resulted in the proliferation of literature about every aspect of indigenous biodiversity knowledge, including its forms of expression (Davis, 1997), place within indigenous cultural systems (Davis, 1998), comparability with western scientific knowledge (Emery, 2002; Gupta, 2001), worldwide decline (Moran 1997, Cox, 1997) and use in bioprospecting.

It is understood in the literature that indigenous knowledge may be used in bioprospecting to assist in the identification of potentially useful species prior to their initial screening, or by guiding testing in other ways (Laird, 2002, p. 270). Some writers have described the particular information sought from indigenous knowledge by bioprospectors; that concerning the methods for preservation, processing and application of species, according to Posey (1997). Elizabetsky (as cited in Moran, King and Carlson, 2001, p. 4) described the information that may be obtained from indigenous knowledge about how to transform a plant into a medicine;'...the correct species, its location, the proper time of collection (some plants are poisonous in certain seasons), the solvent to use (cold, warm or boiling water; alcohol, addition of salt etc.), the way to prepare it (time and conditions to be left in the solvent), and finally, posology (route of administration, dosage).'

Bioprospectors' methods of collecting indigenous knowledge have also been addressed in the literature; in the field, they may interview and observe the work of indigenous healers (Kumar, 2003; Fenwick, 1998) but more often, they source it primarily from databases (Bussmann, 2003; Laird, 2002, p. 271; Hunter and Jones, 2003). Interestingly, there is no consensus on how frequently such collection occurs; it has been said that indigenous knowledge is used in bioprospecting 'in

some cases' (Swiderska, 2001), 'frequently' (Takeshita, 2000, p. 555) and by only 'a small number of bioprospecting research expeditions' (Moran et al., 2001, p. 2), although authors generally agree on the benefits associated with its input. These reportedly include improved efficiency, effectiveness and considerably reduced costs of bioprospecting operations (Fenwick, 1998; Moran et al., 2001, p. 4; Posey, 1997) and some authors have calculated that bioprospecting success rates may be increased by up to 5, 000 times by the use of indigenous knowledge (Weis and Eisner, 1998, p. 1; Bioprospecting/Biopiracy, 1994).

The importance of indigenous knowledge in bioprospecting has also been demonstrated by its contribution to various global industries and markets, particularly the pharmaceutical market. It has frequently been stated that around 75 percent of pharmaceutical drugs worldwide have been developed with the aid of indigenous knowledge (Jones, 2002; Nijar, 1997; Farnsworth, 1988) although the economic value of these products is ambiguous; some authors have referred to a study conducted by Farnsworth (1998) in which it was estimated that indigenous knowledge contributes to around three quarters of US$43 billion, others have quoted the US$43 billion figure as being entirely accounted for by indigenous knowledge (Brush, 1996; Nijar, 1997), and Posey (1997) discredited Farnsworth's original figure as unreliable. Aside from its contribution to the pharmaceutical industry, indigenous knowledge is known to be used in alternative medicine systems by up to 50 percent of people in industrialized countries (Hunter and Jones, 2003) and is estimated to be depended upon for the primary health care of 80 percent of the population of developing nations (Moran, 1997). Thus, regardless of how it is measured, the contribution of indigenous knowledge to the world is considerable.

Inequity in bioprospecting relationships

It is understood by every author in this field that indigenous peoples have seldom been acknowledged or compensated for their contributions to bioprospecting. The 'theft', 'appropriation', or 'biopiracy' of indigenous resources and knowledge has been described as 'an ancient part of the [bioprospecting] industry' (Hunter and Jones, 2003), and centuries-old examples of this activity have been cited (Erdos, 1998; Hunter and Jones, 2003). McGhee (2003) claimed that there has been 'little regard and no sharing of profits' historically associated with the use of indigenous

peoples' resources and knowledge, and the proportion of profits from sales of products embodying indigenous resources and knowledge that has been returned to indigenous peoples has been estimated to be less than 0.001 percent (Posey, as cited by Pimbert, 1997, p. 422). It all amounts to what Weis and Eisner (1998, p. 483) have referred to as 'a dismal history of theft and biopiracy', which according to these authors, now 'sets the tone of discussions' on sharing the benefits of bioprospecting with indigenous peoples.

Aside from issues of compensation, it is also widely recognised that indigenous peoples lack rights over their biodiversity knowledge, which has allowed bioprospectors to claim ownership of traditional knowledge relating to particular species by patenting it (Dutfield, 2000). Whilst Moran et al. (2001, p. 4) explained that this practice is often wrongly believed to infringe upon the performance of indigenous cultural practices, other ways in which indigenous peoples suffer unfairness under current intellectual property rights (IPR) systems are broadly accepted by authors. These include indigenous peoples' loss of control over the use of their knowledge once it falls into bioprospectors' hands (Posey, 1997; Takeshita, 2000, p. 559), their lack the power to influence dominant IPR regimes in their favour or ensure that their own custom-based IPR systems are observed by others (Dutfield, 2000), and their being forced to witness the reduction of their rich cultural knowledge to 'a scientific commodity', which may be ascribed an arbitrary monetary worth that bears no relation to its 'immeasurable cultural value' (Takeshita, 2000, p. 559).

Reasons to address inequity in bioprospecting relationships

A number of important reasons to address inequity in bioprospecting have been identified by writers in this field. First, indigenous peoples have rightfully demanded fairness in bioprospecting in numerous international statements and declarations (Laird, 2002, p. xxvii). Second, bioprospectors' are morally and ethically obliged to 'give back' to indigenous communities in return for the use of their valuable resources and knowledge (King, Carlson and Moran, 1996). Third, providing fair compensation to indigenous peoples for the non-destructive use of their local resources could encourage biodiversity conservation and help to preserve the developing world's rich natural resources (Moran et al., 2001, p. 5; Brush, 1996;

Fenwick, 1998, p. 402). Similarly, compensating indigenous peoples for the use of their traditional knowledge would help to internationally validate this 'highly valuable human cultural resource' and ensure its continued survival (Laird, 1993; Moran et al., 2001, p. 5; King et al., 1996, p. 167).

Whilst indigenous peoples' lack of rights over their knowledge is also viewed by authors as a state of affairs that needs remedying, few clear reasons why have been offered in the literature. Dutfield (2000) suggested this is due to authors taking for granted 'that the protection of traditional knowledge is so important as to require no justification' and, given the amount of scholarship that surrounds all other aspects of indigenous knowledge as it relates to bioprospecting, this is probably a fair assessment.

Measures to address inequity in bioprospecting relationships

There are a number of international, national and other processes in play to address inequity in bioprospecting relationships, and these have commonly been discussed in the literature. Laird (2002, p. xxiii) explained that international treaties affecting bioprospecting relationships include the Convention on Biological Diversity (CBD), the Draft Declaration on the Rights of Indigenous Peoples and the International Labour Organisation Convention 169 (ILO 169). National measures include the development of access and benefit sharing (ABS) and intellectual property rights (IPR) legislation, and amongst the others are institutional policies, contracts, codes of ethics and research guidelines (Laird, 2002, p. xxiii). Whilst each of these measures has been the subject of much discourse, it is beyond the scope of this review to consider all the literature surrounding these topics. Understanding the later sections of this review requires familiarity with only a minimal amount of information about the CBD, national ABS and IPR laws, and bioprospecting contracts. Thus, what follows are some key, well accepted points on each.

Convention on Biological Diversity

> The CBD is an international agreement now ratified by more than 188 countries, which encourages sustainable use of the earth's biodiversity and the equitable sharing of benefits arising from its use. It provides a framework for 'fair and equitable' bioprospecting by requiring its member nations to develop national ABS legislation, and

it promotes protection of indigenous peoples' rights over their resources and knowledge by requiring member countries to improve existing IPR systems or replace them with an entirely different form of protective legislation.

Access and benefit sharing legislation

Signatory countries of the CBD must regulate access to the biodiversity within their boundaries and ensure the fair sharing of benefits arising from its use by developing national ABS legislation.

Traditional knowledge legislation

Signatory countries of the CBD must ensure protection of the rights of indigenous peoples over their resources and knowledge by modifying existing intellectual property rights regimes or developing new legislation of a different type.

Bioprospecting contracts

Bioprospecting contracts are entered into by the users and providers of biodiversity. They are legally binding agreements consisting of terms which are mutually agreed upon by the collaborating parties, regarding access to biodiversity and the fair sharing of benefits arising from its use.

Indigenous peoples' participation

Whilst the CBD has been widely commended for promoting fair benefit sharing and the protection of indigenous knowledge, authors have pointed out that it remains ineffective until nations have developed and successfully implemented ABS and IPR legislation. This requires the full participation of all those who will be affected by it, including indigenous communities (Swiderska, 2001; Greer & Harvey, 2004, p. 4; Sharing the Benefits, 2003). According to Dutfield (2000), the involvement of indigenous peoples in the development of new legislation in the past has been 'very rare indeed', but strong arguments for this trend to be reversed now exist. Indigenous peoples have demanded the right to participate in all decisions affecting them (Laird, 2002, p. 228), the 2000 Fifth Conference of the Parties recognised the 'fundamental importance of ensuring the full and effective participation of indigenous and local communities' in the development of ABS and IPR legislation, and Convention 169 of the International Labor Organization requires countries to

consult with indigenous peoples 'whenever consideration is being given to legislation or administrative measures which might affect them directly' (Swiderska, 2001).

Such measures include bioprospecting contracts, which are known to 'govern the nitty gritty' of bioprospecting arrangements, and which are expected to become the primary means for indigenous peoples to control access to, and secure benefits from, their resources (Laird, 2002, p. 219; Davis, 1998; Rosenthal, 1997). Bioprospecting contracts, in theory, offer mutually beneficial results for biodiversity users and providers, and are developed via negotiations involving the full and effective participation of all stakeholders (Borraz, n.d.). However, no secret surrounds the fact that 'the negotiation of [bioprospecting] agreements does not favour...indigenous and local communities as much as bioprospectors' (Laird, 2002, p. 419), and indigenous peoples have described their position in such negotiations as 'extremely weak' (Borraz, n.d.). Whilst the imbalance between bioprospectors and indigenous peoples in negotiations has been attributed to differences in each sides' financial, technical and human resources, negotiation expertise and languages (Pimbert, 1997, p. 418; Erdos, 1998; Swiderska, 2001), it is also largely a result of 'gross imbalances in [their] legal, commercial and scientific knowledge' (Laird, 2002, p. 419).

Information for capacity-building of indigenous communities

It has been observed by Swiderska (2001) that 'particular efforts are often required to build the capacity of indigenous and local communities to participate effectively and on equal footing as those [bioprospecting] stakeholders with better access to information' and she has been one of many authors to remark that such capacity building must involve raising the awareness of indigenous communities about bioprospecting (see Sharing the Benefits, 2003; Janke, 1998; Greer & Harvey, 2004). Borraz (n.d.) reported that indigenous peoples have requested greater sharing of information related to biodiversity and traditional knowledge use, to 'allow them to make more informed decisions' on these matters, and Weis and Eisner (1998, p. 494) stressed that providing indigenous communities with a basic understanding of both the issues and practical considerations surrounding bioprospecting will allow them to 'defend their own interests on the basis of their own sophisticated technical

understanding' and is ultimately 'the best way to assure equitable treatment for indigenous peoples [in bioprospecting relationships]'.

To date, bioprospecting related information has generally been communicated to indigenous communities as part of either: bioprospectors' efforts to obtain prior informed consent (PIC) from them before accessing their resources and knowledge; or biodiversity awareness-raising programs run by governments or organisations (see Rosenthal 2003; Hayden, 2003, p. 360). The former type of project involves bioprospectors fully explaining their planned research - including the reasons for it and the procedures and potential risks involved (Laird, 2002, p. 190) - to communities, whilst the latter involves the transfer of more general information about biodiversity and its potential uses to communities. Combined, these initiatives have used diverse approaches, methods and tools to share information with a number of communities, improved the ability of these groups to make informed decisions on bioprospecting, and contributed important lessons on communicating bioprospecting and biodiversity information to indigenous communities.

However, much is yet to be accomplished and learned in this area. Before plans to build upon the biodiversity knowledge of indigenous communities are further developed, it is important to understand what level of bioprospecting awareness already exists in this target audience, and assessments of communities' bioprospecting knowledge are required on an on-going basis due to the rapidly-changing nature of bioprospecting technologies and legislation. Equally, the development of appropriate bioprospecting communications programs will require an understanding of the particular types of information that are likely to prove valuable to indigenous communities, and investigations into the usefulness and effectiveness of new media and tools for sharing bioprospecting information with indigenous communities are required to keep pace with developments in communications in today's information society.

A unique opportunity for investigation

It was with the knowledge that improvements in our collective knowledge on such aspects of communicating bioprospecting information to indigenous communities are much needed that I seized upon a relevant and accessible international conference involving the communication of bioprospecting information to indigenous communities as a research opportunity for this study.

The international *Indigenous Knowledge and Bioprospecting* conference - held in Sydney in 2004 - represented a unique opportunity for investigating the communication of bioprospecting information to indigenous communities. This event was specifically organised to address the issues surrounding indigenous peoples' involvement in bioprospecting, and its proceedings were expected to be extremely relevant to indigenous communities. Additionally, organisers of the conference planned to communicate information from the event to indigenous communities using a number of different media and tools, the most prominently advertised of which was a documentary about the conference which would be made available to communities on DVD.

With the intention of contributing potentially valuable information to future bioprospecting communications projects, I aim to gain insights into the likely value and effectiveness of efforts to communicate information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities. Thus, in this research I will investigate the opinions of experts at the conference on:

- how well informed particular groups of indigenous peoples are about bioprospecting,
- the importance of communicating bioprospecting information from the 2004 international *Indigenous Knowledge and Bioprospecting* forum to indigenous communities, and
- the likely effectiveness of a DVD documentary as a tool for communicating bioprospecting information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities.

In the next chapter, the methods used to conduct this research are detailed.

CHAPTER 3 - METHODOLOGY

Outline

In this study I aimed to investigate the opinions of a group of experts in bioprospecting and indigenous peoples issues on matters related to communicating bioprospecting information from the 2004 international *Indigenous Knowledge and Bioprospecting* conference to indigenous communities. To achieve this, I sought the perspectives of presenters at the conference on:

- how well informed particular indigenous peoples are about bioprospecting
- the importance of communicating information from the conference to indigenous communities, and
- the likely effectiveness of a particular tool in communicating information from the conference to indigenous communities.

Research was based on interviews with conference presenters which, with one exception, I conducted at the *Indigenous Knowledge and Bioprospecting* conference at Macquarie University in Sydney in April 2004.

Following is an account of how this research was designed and conducted.

Designing the research

Generating a research focus

I developed the focus of this research after my interest in this subject area led me to undertake preliminary exploration of the bioprospecting and indigenous peoples literature. Whilst beginning research with an in-depth consideration of the existing literature is recommended by the traditional research paradigm (Robson, 1993, p. 23), and generating a focus of inquiry prior to consulting the literature is advised by many modern researchers (Robson, 1993, p. 23), I found a compromise between these strategies to be most useful; I used the literature to provide me with a basic understanding of my chosen topic both before developing my research focus and afterwards, to gain a more detailed knowledge of existing research in this area. As advised by Maykut and Morehouse (1994, p. 54) and Holliday (2002, p. 36), I

considered my new research focus to be important for leading my study in a certain direction, yet open to development and adaptation as my investigation progressed.

Determining the research strategy

It was the broad, open-ended nature of my research focus that determined I use a qualitative research strategy in this study. As explained by Robson (1993), a research focus may have an important influence on the selection of a research strategy, and an exploratory and descriptive focus of inquiry is an important characteristic of qualitative research (Maykut and Morehouse, 1994, p. 43). Qualitative research follows a phenomenological philosophy and seeks to provide an understanding of social phenomena from the participant's perspective (Lester, 1999) whilst quantitative research is based on positivism and seeks the facts or causes of social phenomena apart from the subjective states of individuals (Taylor and Bogdan, 1984, p. 1). Since it was in exploring qualitative aspects of communicating bioprospecting information to indigenous communities that I was interested, I adopted a qualitative research strategy to best allow the realisation of my research goals.

Choosing the research setting

In finding a suitable setting in which to conduct my research, I carefully balanced *taking the opportunity* to encounter a research setting with *maintaining the principles of social science,* as advised by Holliday (2002, p. 9). Fortuitously, I discovered the 2004 Sydney *Indigenous Knowledge and Bioprospecting* conference three months prior to it being held, through exploring internet-based material relevant to my focus of inquiry. The event immediately struck me as a potential research setting and I investigated it using the conference web site and through communicating with the conference organisers. My efforts revealed that the conference would offer the following advantages as a research setting:

- the theme of the conference and its proposed key topics for consultation were directly relevant to my area of interest,
- the conference program included communicating information from the event to indigenous communities around the world,

- the conference offered access to valuable potential informants for this research; conference presenters and participants,
- the uniqueness of the conference - both nationally and internationally - contributed to the value of this event as a research opportunity, and
- the dates and location of the conference made it accessible to me as a research setting.

Importantly, the conference also matched the criteria for research settings outlined by Holliday (2002, p. 38), and the characteristics of an 'ideal research setting', listed by Taylor and Bogdan (1984, p. 19), in that it provided richness and a variety of relevant and interconnected data yet had a sense of boundedness and was sufficiently small and accessible. Thus the *Indigenous Knowledge and Bioprospecting* conference qualified in every sense as an appropriate setting for my research and I established it as such.

Formulating the research questions

Confirmation of the *Indigenous Knowledge and Bioprospecting* conference as my research setting directed the development of my initial set of research questions, a sequence of events common within qualitative research (Holliday, 2002, p. 37). As recommended by Taylor and Bogdan (1984, p. 16), these questions were both substantive (ie. specific to issues related directly to the conference) and theoretical (ie. based on broader issues) and I considered them to be a 'set of possibilities' rather than 'fixed absolutes for the research' (Taylor and Bogdan, 1984, p. 5). I also gave practical consideration to what would be possible to accomplish with the limited resources available for this study and I heeded the common-sense warning of Maxwell (1996, p. 52) that research questions need to be ones that are answerable by the kind of study you could actually conduct. Thus, equipped with a preliminary set of questions that I wished to answer through my research, I began considering how I would select research subjects who could help me to answer them.

Developing a sampling strategy

Through conducting my research at the 2004 Sydney *Indigenous Knowledge and Bioprospecting* conference, I hoped to gain access to the conference presenters as

informants for my research. I judged the presenters to be experts in my field of study because they had been invited to share their specialised knowledge at the international forum in question, and in research circles, subjects who are selected on the basis of their expertise in areas relevant to the research are known as 'elites' (Marshall, 1989, as cited in Sources of News, n.d.). There are a number of reasons to analyse elites; they can provide valuable information because of their social, political, financial or administrative positions and can contribute insight and meaning to the data collection process because they are intelligent and quick-thinking people at home in the realms of ideas, policies and generalisations (Marshall and Rossman, 1995, p. 84). Thus, like all researchers choosing to analyse elites, I hoped that my research would benefit from this sampling strategy.

Due to both the large number of conference presenters and the busy conference schedule, consulting *all* presenters at the conference would have been an unrealistic goal. I determined that individual presenters at the conference would be selected for consultation on an opportunistic basis, and I aimed to consult as many conference presenters as time would allow.

Selecting a method of data collection

Determining the nature of my consultations with presenters was the next stage in my research design. I opted to use face-to-face interviews because this is the most appropriate method for collecting information from elites when seeking to understand their perspectives, as was the case in this study (Notes on Elite Interviewing, 2002). As Fielding (as cited in Marsh and Stoker, 1995, p.141) pointed out, it is by listening to interviewees talking that we may gain some insight into their world views and see things as they do and interviews, explained May (cited in Lilleker, 2003) have the 'potential to provide rich and highly illuminating insights into people's biographies, experiences, opinions, values, aspirations, attitudes and feelings'. Interviewing would also allow me to gather large amounts of information quickly and to immediately clarify questions for presenters and respond to any queries (Marshall and Rossman, 1995, p. 81). Specifically, face-to-face interviewing - the most popular technique for analysing

elites (Notes on Elite Interviewing, 2002) - was used to collect data from the conference presenters in this study.

At this point, opportunism again played a role in my research design by influencing how I would record the interviews with presenters. A chance for me to film my research interviews arrived prior to the conference, when I learned from the conference organisers that a video documentary of the event would be produced. It was to include presentation highlights and interviews with presenters on issues related to the conference theme. Filming for the documentary would take place at the conference and an independent multi-media professional would be responsible for the documentary's production. Motivated by both a personal interest in becoming involved in the making of the documentary and by my wish to secure access to presenters for this research, I volunteered to assist in filming the documentary. I discussed with my 'filming supervisor' the possibility of using my interview opportunities with presenters to ask questions for this research, which was deemed acceptable providing the full consent of presenters was received. Thus, my taking the opportunity to be associated with the documentary project affected my decision to use video as the method for recording presenter interviews.

However, it is no coincidence that this method of recording interviews was likely to benefit my research; I was aware that video recording can provide a researcher with more contextual data than can audio-recorded data, denser linguistic information than can field notes, and give a more complete sense of who the interviewees are (Dufon, 2002). As explained by Dufon (2002), the visual information about interviewees' that is captured by video - including posture, gestures, facial expressions and other visual interactional cues - can greatly enrich data and also help a researcher to disambiguate verbal messages. This is particularly important when interviewees are non-native speakers - as I expected many of my interviewees to be - who are likely to rely more heavily on extralinguistic means to convey messages (Dufon, 2002). Additionally, video recording can allow an event to be experienced repeatedly by playing it back, thus allowing a researcher to see things they had not seen at the time of filming or on

previous viewings (Erickson, as cited in Dufon, 2002). I believed these advantages of video would facilitate my gaining rich and accurate data from my interviews with presenters.

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Designing the interviews

The last stage in my research design was designing the interviews, and I decided that a semi-structured interview method using open-ended questions - a type of interview often used in elite interviewing (Leech, 2002) - would best suit the purposes of this research. I hoped to combine some of the strengths of unstructured and fully-structured interview methods; namely flexibility and case comparability. The flexibility offered by less structured interview styles helps a researcher to obtain a qualitatively rich array of personal insights from subjects, which tends to be particularly important in the analysis of elites, whose complex and detailed knowledge will wish to be drawn upon by the researcher (Notes on Elite Interviewing, 2002). Conversely, more structured interview types can help to ensure the comparability of data across sources and allow for more straightforward data analysis (Notes on Elite Interviewing, 2002). Thus, I intended that through using semi-structured interviews to collect data from presenters, I would be more likely to elicit 'affective and value-laden' responses from my interviewees (Robson, 1993, p. 261), which would be comparable and allow a degree of generalisation.

I planned to use open-ended interview questions in my interviews of presenters, for a number of reasons. First, these would allow me to best exploit the specialist knowledge of the presenters and could lead to unexpected answers, which can enrich research by introducing unthought-of aspects of the issue under investigation (Cohen and Manion, as cited in Robson, 1993, p. 233). Second, I hoped that using open-ended questions would improve the validity of presenters' responses, as this approach allows a truer expression of what the respondent really believes (Cohen and Manion, as cited in Robson, 1993, p. 233). Finally, my elite subjects were likely to be well-educated and articulate and to prefer explaining why they think what they think, rather than be 'straightjacketed' by questions which force them to choose one of a number of pre-set

answers (Aberbach and Rockman, 2002). Additionally, my research questions which were of a scale type - ie. asking for a response in the form of degree of agreement or disagreement - would be accompanied by prompts to elicit unconstrained answers (Judd et al., 1991, p. 239).

Naturally, the process of interview design was ongoing throughout my research and was particularly influenced by my arrival at the conference venue. Taylor and Bogdan (1984, p. 16) state that 'until we enter the field, we do not know what questions to ask or how to ask them' and in order to improve my interview guide, I spent the first two days of the four-day Sydney *Indigenous Knowledge and Bioprospecting* conference gaining a sense of the atmosphere of the event, the language used and the topics addressed by speakers through observing the presentations. I used this information to make changes to my interview guide, largely to ensure the interviews would be more casual and conversational than they would otherwise have been. This step is advised by Hay (2000, p. 55), who reflects that questions which are prepared before the interview and then read out formally may sound insincere, stilted and out of place. Following the commencement of interviewing, I made other minor changes to the interview guide after receiving feedback from interviewees, and also altered the order and wording of questions to suit individual interviewees.

Data collection procedures

I conducted interviews of presenters at the *Indigenous Knowledge and Bioprospecting* conference on days three and four of the event during recesses in the program. I interviewed the presenters privately and recorded all interviews with a hand-held video camera. There was one exception to these circumstances; an interview with one of the keynote speakers was conducted by my 'filming supervisor', who used my interview guide, at a location off the conference site due to reasons of convenience for the interviewee.

In soliciting interviewees at the conference venue, I approached presenters individually, introduced myself and explained the two reasons for interviews being conducted at the

conference - ie. for the documentary and for my research project. I informed potential interviewees that the audio-visual material collected during the interview would be used to contribute to both projects and that the completion of each project would depend on their approving its content, and I answered any questions presenters had concerning these issues. I then asked presenters for their consent to be interviewed and those agreeing (only two declined) were encouraged to move to a relatively quiet place where interruptions and distractions were less likely. I asked interviewees the following questions:

1. How well informed about bioprospecting do you believe the indigenous peoples with whom you are familiar are?
2. What is importance of communicating information from the 2004 international *Indigenous Knowledge and Bioprospecting* forum to indigenous communities? and
3. How effective do you think a DVD documentary is likely to prove as a tool for communicating bioprospecting information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities?

Regarding the first question, interviewees were asked to consider the bioprospecting knowledge of the indigenous peoples of either their country of origin or the geographic area in which they had extensive experience. I judged this according to which indigenous peoples the experts referred to in their presentations.

It must be noted that interviewees did not all respond to the same number of questions, for two reasons. First, I addressed some questions to presenters who had presented an indigenous perspective in their presentations, which I generally did not ask of the others. This is because I wanted to capitalise on the former groups' apparent specialised knowledge and experience of indigenous issues in relation to bioprospecting, which I believed was important for providing meaningful insights into the topic areas in question. Second, time restrictions meant that some interviewees responded to fewer questions than others, as it was not always possible within the available time to ask every prepared question of a presenter. All interviews concluded with my thanking the expert for their time.

The application for research to be conducted for this study was approved by the Australian National University Human Research Ethics Committee, protocol number 2004/182 (see Appendix I).

Data analysis

In preparation for data analysis, I fully transcribed the video recorded interviews with presenters. My first step in analysing the data was organising the transcribed material so that respondents' answers to each interview question were grouped together. The responses relevant to three of my interview questions were analysed using the constant comparative method, which involved reading and re-reading responses until different categories, themes and patterns became apparent. Phrases and passages were assigned a code according to their content, and then grouped together with others of a similar nature. These groupings then formed the basis of my data analysis and presentation.

Following completion of the writing of this thesis, I contacted all interviewees to seek their final approval of the use of quotes from their interviews in this study.

Assumptions and limitations

An assumption made in this study was that my interviewing presenters for the purpose of the video documentary did not affect their responses to my interview questions for this research. In order to reduce any possible bias for this reason, I had made it clear to interviewees that I had no allegiance to the documentary, and whilst I believe that presenters responded openly and honestly to my interview questions, the influence of my involvement in both projects on the results of this study is ultimately unknown.

Because I only had the opportunity to interview presenters during the relatively short breaks in the busy conference program, time restrictions limited both the number of interviews conducted for this research, and the length of interviews. Nevertheless, I decided not to conduct interviews away from the conference venue, for two reasons. First, most of the presenters had travelled internationally to attend the conference in

Sydney and would be staying in the country only for its duration. Whilst here, their schedules were made very busy by the conference program, which involved presentations running throughout the day until around 7pm, and social and cultural events in the evenings. Thus, my chances of conducting productive face-to-face research interviews with presenters away from the conference venue were negligible. Second, I aimed for consistency in the setting and timing of my interviews to reduce the biases likely to accompany their being conducted in different environments or at times outside of the conference dates.

In the next chapter, the findings suggested by analysis of presenters' responses to my interview questions are presented, along with further information about the 2004 Sydney *Indigenous Knowledge and Bioprospecting* conference.

CHAPTER 4 - RESULTS

The *Indigenous Knowledge and Bioprospecting* conference

The international *Indigenous Knowledge and Bioprospecting* conference was held at Macquarie University in Sydney from 21 to 24 April 2004. More than 150 participants and 41 presenters attended the conference, and indigenous peoples were well represented within each group. Presenters were from Australia, Canada, Cameroon, India, the Netherlands, New Zealand, Nigeria, the Philippines, South Africa, the United Kingdom and the United States and their cultural backgrounds included Aboriginal, African, Indian, Maori and Native American. Speakers' professions included academic, lawyer, development worker, indigenous activist, indigenous rights consultant, microbiologist, ethnobotanist, horticulturalist, pharmacist, author, philosopher, research scientist, IT professional and historian. They contributed perspectives on indigenous knowledge and bioprospecting issues from the disciplines of science, law, anthropology, economics, sociology, history and philosophy.

Presentations were delivered throughout five themed sessions over the four-day conference program and many topics of discussion were covered (see Table 1.0). The style of presentations varied greatly - from formal deliveries of scientific research findings to highly-charged, emotional recounts of personal histories and demands for justice - although there was a strong tendency for the indigenous presenters to deliver more passionate speeches than their non-indigenous counterparts. A number of the indigenous presenters viewed the bioprospecting enterprise as an exploitative Western endeavour and references to the mistreatment of indigenous peoples under dominant western regimes were common. Their presentations appeared to promote solidarity between the indigenous delegates, but sometimes produced a feeling of discord between indigenous and western delegates, which effect was arguably either necessary to 'move forward' through the issues raised or counterproductive to this goal.

Table 1.0 Major topics of discussion at the *Indigenous Knowledge and Bioprospecting* conference.

Bioprospecting and health

- The increase of bioprospecting around the world in the search for disease cures.
- Current bioprospecting research in Australia and South Africa to find cures for HIV/AIDS, cancer and malaria.
- The race for scientific and commercial progress must not threaten the traditional ways of life in indigenous communities.

Concerns of indigenous peoples

- Indigenous peoples' lives are inextricably connected with the land and living resources, the disturbance of which threatens the survival and continuity of indigenous cultures.
- The responsibility in many indigenous cultures, to ensure that knowledge is not used wrongly once it has been given away, is undermined by bioprospecting.
- A clash between indigenous and Western concepts of 'ownership' exists, inhibiting the protection of indigenous peoples' biological

The legal context

- Legal language must be made more accessible to indigenous peoples.
- Current intellectual property regimes, based on Western concepts of ownership and invention, are inadequate to protect indigenous traditional knowledge.
- New legal regimes should be designed specifically to safeguard indigenous knowledge.

International instruments

- The 1996 Convention on Biological Diversity and the 2001 International Treaty on Plant Genetic Resources for Food and Agriculture are instruments through which local communities can pursue their rights to biological resources and traditional knowledge at national and international levels.
- The outcomes of international policies and declarations need to be better disseminated at a local level to help raise indigenous

resources and knowledge against biopiracy.

peoples' awareness of their rights.

The way forward

- Work towards achieving equality between western and indigenous bioprospecting stakeholders.
- Form indigenous-owned companies based on botanical knowledge.
- Record and preserve indigenous traditional knowledge to protect indigenous intellectual property rights.

Additional events in the conference program included:

- a traditional Aboriginal smoking ceremony, which officially opened the event,
- a welcome to all conference participants by members of the Darug people, on whose traditional lands the city of Sydney now stands,
- cultural performances by Aboriginal and Torres Strait Islander and Pacific Islander dance groups, and
- a workshop focused on the development of appropriate ethical protocols for consultation with indigenous peoples.

Filming for the video documentary about the conference proceeded as planned; all presentations, the cultural performances and the workshop were video-recorded and many presenters and participants were interviewed. For the purposes of this research, I interviewed fourteen 'expert' presenters.

The experts

The presenters I interviewed for this research came from Australia, Cameroon, Holland, India, New Zealand, Nigeria, the Philippines, South Africa and the United States. Their disciplines included botany, community development, economics, history, horticulture, philosophy, sociology and theology, with law being the best represented area of expertise. Biographical information for each interviewee and the

title and key message of each speaker's presentation at the conference - as described in their words - are provided in Table 1.1.

Table 1.1 Biographical and presentation details relating to each interviewed expert.

Name and biographical details	**Title and key message of presentation**
Dr Ikechi Maduka Mgbeoji From Nigeria, Ikechi studied law in Lagos, Nigeria and in Nova Scotia, Canada. He is an intellectual property lawyer and a professor of law at Osmonde Hall Law School in Canada. Ikechi is also a member of the World Conservation Union's Commission on Environmental Law.	Title: *'Insurgents at the gates? Patents, biopiracy and the legitimation of Indigenous peoples' knowledge in post-colonial international intellectual property law.'* Key message: *'...The...appropriation of indigenous peoples' knowledge...is a function of several faculties - legal, social and historical - so unless we have this broader understanding of the forces and decisions and the instruments which have facilitated ...the theft of indigenous peoples' knowledge, then our understanding will be very, very narrow.'*
Dr James West James is a professor of economics at Moravian College in Pennsylvania, USA. He has extensive background in international relations, having been a Fulbright Scholar to	Title: *'Reflective property rights: Reconciling indigenous and industrial institutions of prosperity.'* Key message: *'...That in order to morally engage in economic activity... and to*

Slovakia and worked in economic rural development in India for 3 years.	*behave ethically in the economic environment, we need to reflect... on what constitutes a legal and moral holding of property, and... get a more broad and spiritual perspective - combined with the material perspective - of ... the rights, obligations and duties of those who hold property and how that property is both used and distributed among people.'*
Ms Inotoli Zhimomi From Nagaland in north-east India, Inotoli has recently completed a Masters degree in Melbourne. Inotoli's passion for working towards reconciliation in her native Nagaland developed during her upbringing when she witnessed the suffering of her people at the hands of Indian soldiers. She was drawn to the possibility of fighting as a guerilla in one of the liberation groups but instead went on to study theology and to teach in a refugee camp on the Thai/Burma border.	Title: *'Indigenous education and the formation of Naga identity.'* Key message: *'That we are capable [people] – the Nagas. Like other indigenous people, we...are not to be ...objectified and studied and scrutinised and ...described... We are able people like anyone else ...and the recognition that we are is very important...[At the] indigenous education centre in Nagaland...we wanted to seriously look at the customary law and what we can do to use that to protect ourselves from reckless researchers of all kinds and outside invasion again...So that's what I try to tell people – that we are not helpless people, we are able...and we can do it. It you want to respect us, let's work together.'*

Mr Marcelin Tonye Mahop Marcelin is originally from Cameroon and currently a PhD intellectual property law scholar at the Queen Mary Intellectual Property Research Institute in London. His thesis is focused on intellectual property rights, biodiversity and traditional knowledge. Marcelin also holds a Natural Sciences degree and two Master degrees in Biological Sciences from the University of Yaounde in Cameroon.	Title: *'Evaluation of the context and assessment of the basic elements for consideration in a sui generis Access and Benefit sharing law in Cameroon.'* Key message: *'...To give the authority back to the communities...There's no way around it...If you want them to feel that they are really owning these resources, we have to give the authority over determining access to them back to the communities.'*
Mr Kim Courtenay Kim works with the Kimberley College of TAFE in Western Australia as a horticulture lecturer and a specialist in practical horticulture training for Aboriginal people. He has pioneered the cultivation of a number of native plants in the Kimberley, and has more than 20 years experience in the northern Australia horticulture industry. Kim is also a trained journalist and writes for newspapers and magazines on horticulture related issues.	Title: *'Taming the wild plum.'* Key message: *'I'm going to be talking about what we're doing up there [in the Kimberley] and ...giving people an example of a real life version of bioprospecting as it's happening, so...I'm hoping that people can give me as much feedback as what I can give them on what they're doing.'*

Mr Jerzy Koopman Jerzy is a Dutch intellectual property lawyer presently pursuing a PhD at the Centre for Intellectual Property Law at the Molengraaff Institute for Private Law of Utrecht University in the Netherlands. His thesis is titled *'Sharing Nature and its Biodiversity: Claims to genetic resources, technology and biotechnological products in a proprietary perspective'* and it investigates different perspectives on the manner in which patent law may apply to resources and outcomes of biotechnological innovation.	Title: *'The protection of traditional knowledge resources of biotechnology: Are we doing it right?'* Key message: *'...That there is a need to acknowledge... that we have so many local perspectives and angles to things that are happening on a global scale...[for instance] in biotechnology and also...to open up to each other to step over the barriers that we may perceive and...search for common vision and values and try to put to rest common concerns that we have in different parts of the world... for common and shared solutions ...It [my presentation] was focused on patent law, of course, but this is the key message....'*
Dr Manuka Henare Manuka is a Maori New Zealander and presently a senior lecturer at The University of Auckland, New Zealand. He previously lectured in Maori Studies at Victoria University in Wellington, where he taught courses on the Treaty of Waitangi, Maori Culture and Society and Tribal Histories. He	Title: *'I nga wa o mua, Maori and bioprospecting: Traditional knowledge, world view and historical experience in the shaping of and indigenous peoples' policy on bioprospecting.'* Key message: *'What I offered in the presentation was an approach that a Maori might take, looking at*

has also been the CEO of two national non-government organisations involved in international development, justice and peace.	*bioprospecting... That approach would draw on two sources:...our traditional metaphysical...world view ...that we use to make moral judgements about the good or the bad in bioprospecting, and secondly, what does history teach us about how our ancestors looked at new technologies?...What I find is...historical experience tells us to keep an open mind, inquire, then make judgements as you get to understand the technology...We don't necessarily have to access someone else's methods without questioning them.'*
Mr Bevan Koopman Bevan is a research scientist with the Cooperative Research Centre for Enterprise Distributed Systems Technology, and has recently helped the CRC to develop software tools designed to enable indigenous communities to preserve and protect their cultural and biological knowledge through digital technologies.	Title: *'Software tools for indigenous knowledge management.'* Key message: *'...One of the key messages was...a wake up call saying we really need to start thinking about these protocols and ...these issues...before it's too late.'*
Mr Bevan Cassady Bevan is a Nwyaigi warrior from Nwyaigi and Tanna Island. He is	Title: *'The chains just keep getting longer.'*

the National Coordinator for the Bachelor of Teaching, Early Childhood Services Degree Program, a nationally recognised Aboriginal and Torres Strait Islander Early Childhood Teaching program at Macquarie University in Sydney, Australia. He has extensive experience in teaching, particularly Aboriginal and Torres Straight Islander children and has been involved in many community and state based initiatives in Aboriginal and Torres Straight Islander Education.	Key message: *'That traditional knowledge... needs to be ...given the same respect, understanding and position [as non-indigenous knowledge] and needs to be nurtured in the institutions that...develop the individuals who develop the systems that impact on the peoples who live in our societies across the world...Universities must evolve from their 'traditional' ways of operating.'*
Dr Anne Waters Anne is a lawyer, philosopher, indigenist, writer and poet, currently lecturing at California State University. She completed her doctorates of Law and Philosophy in the USA. Dr Water's current research focuses on American Indian Metaphysics and Epistemology.	Title: *'Global indigenous research contexts and bioprospecting: Sitting at the table with ethnobotany, diversity genetics, intellectual property law, sovereign rights and 'public interest' pharmaceuticals.'* Key message: '*Many indigenous medical practitioners do not currently see a place for themselves in bioprospecting projects...without violation of their fundamental values inherent in their very identity as indigenous peoples. To participate in a global market of*

	bioprospecting without international recognition and respect for sovereign rights of indigenous nations and communities...can be equivalent to renouncing their faith; certainly this is not a realistic option. ... [A] concern that needs addressing is whether enough information is currently available about bioprospecting for a realistic assessment of indigenous involvement...'
Mr Errol Douwes Errol is South African and currently working towards his Master of Botanical Bioprospecting degree at the University of KwaZulu-Natal in South Africa. His current research is focused on developing novel treatments for malaria from South African plants, for low-cost international distribution.	Title: *'Bioprospecting for anti-malarial compounds: a semi-quantitative approach with promising results.'* Key message: *'...The key message of my presentation...was [that a] collaborative effort...is being made in South Africa between research institutions and the government in South Africa, along with traditional healers...[to develop] anti-malarial drugs which can be used in South Africa and possibly also developed into a drug which can be distributed worldwide – hopefully for some sort of revenue benefit for the country and healers from where the traditional knowledge has been sourced.'*

Dr Celerina Balucan Celerina is a Filipino lecturer and researcher in the Research, Planning and Development Office at Lordes College in Cagayan de Oro City in the Philippines.	Title: *'Disturb not the land: An assurance of protection and continuity of indigenous, cultural and biological diversity.'* Key message: *'...The message is...if it could be prevented or avoided, the land should not be disturbed so that...indigenous knowledge, cultural diversity and biological diversity could be protected and ...we could promote [their] continuity. But if ever development could not be prevented...then these people [the traditional owners] should be contacted before any...development projects could be done.'*
Mr Lindsay Mell Lindsay is President of the New South Wales United Nations Association. His background is in teaching, journalism and sociology and he has extensive experience in community development. Lindsay has been responsible for initiatives of local, regional and national significance, including the International Year of Community.	Title: *'The Community Project.'* Key message: *'The presentation was about the community project which I coordinate...We have an International Year of Community proposal that we're trying to encourage people to accept and we've incorporated that into a project...[called] the Community Project...We've also tried to work on*

	initiatives that we consider might be pertinent for such an International Year, which we presume will be declared at some time in the future by the United Nations General Assembly...'
Mr Michael Davis Michael is an Australian historian, writer, researcher and policy specialist with extensive experience in indigenous heritage, rights in traditional knowledge, intellectual property and biodiversity. He has worked at local, regional, national and international levels as a policy specialist for organisations including AusAID, the National Native Title Tribunal, the Parliamentary Information and Research Service, the North Queensland Aboriginal Land Council and ATSIC's Cairns and District Regional Council. He has lectured at LaTrobe University in Melbourne and held honorary appointments at the Australian National University and the Australian Institute of Aboriginal and Torres Straight Islander Studies.	Title: *'Indigenous knowledge, ethics and bioprospecting.'* Key message: *'My presentation was really trying to um...move beyond saying 'well, these are the problems, what do we do about them?' I was highlighting ...[that] we know now that intellectual property rights aren't appropriate and don't work for recognising and protecting indigenous knowledge so where can we move from there towards a good outcome?... I was pointing to some of the work that's being done internationally...in developing codes of ethics, guidelines and protocols and at the same time, also...[arguing] that there needs to be a much stronger emphasis on community empowerment and [placing] the focus on indigenous nations and indigenous peoples themselves, strengthening their rights and them being the initiators of projects.'*

Experts' responses to interview questions

Bioprospecting awareness amongst the indigenous peoples with whom experts are familiar

Summary

Of the seven conference presenters who were asked how well informed about bioprospecting they believed a particular group of indigenous peoples were, only one responded with a definitive statement, and he believed the peoples in question were poorly informed. Three respondents' opinions about a group of indigenous peoples' understanding of bioprospecting were qualified in some way; indigenous peoples were considered to be varyingly informed on different aspects of the broad bioprospecting topic, and it was implied that bioprospecting knowledge varied between the different indigenous tribes of a nation and between different individuals within an indigenous community. Other experts did not provide any direct comments on this subject, but discussed related issues such as the difficulties faced by indigenous peoples in becoming familiar with an enterprise so suddenly arrived in their communities and so alien to their cultures, and the need for improved information flow between indigenous communities and bioprospectors.

Poorly informed

Marcelin Tonye Mahop, an intellectual property scholar originally from Cameroon, clearly expressed concern that the indigenous peoples of Cameroon are not well informed about bioprospecting:

'They are not. They are not. They are really not informed about bioprospecting. They don't know anything about things like patents or intellectual property in general. I think they just come across these subjects when they meet people who ask them for information or for plants. There's an issue of awareness raising as at the moment they are really ignorant about bioprospecting.'

Varyingly informed

Other presenters expressed similar concerns, but indicated that the bioprospecting knowledge of the indigenous peoples they were considering was poor in regards to

some, but not necessarily all, aspects of the broad bioprospecting topic. For example, on multiple other occasions the legal issues associated with bioprospecting were identified as being subject areas on which the indigenous peoples in question were poorly informed.

Kim Courtenay, a horticulture academic from Western Australia who provides skills training for the bushtucker industry to Aboriginal people of the Kimberley, acknowledged the legal aspects of bioprospecting as being just one in a number of areas likely to be poorly understood by the indigenous people of the Kimberley:

'I think they're probably not that well informed about the legal aspects of it [bioprospecting] and those more technical, economic and academic aspects of it...'

Whilst similarly identifying the legal and technical aspects of bioprospecting as areas in which she believed the knowledge of the Naga people of India and Myanmar was poor, Inotoli Zhimomi, a scholar from Nagaland, also implied that the global nature of bioprospecting issues inhibited her people's understanding of bioprospecting:

'...the international laws and the technicality of it [bioprospecting] is not known.'

In contrast, aspects of bioprospecting about which particular indigenous peoples were believed to be well informed were also identified by one presenter. Kim Courtenay defined two important aspects of bioprospecting in which he believed the indigenous people of the Kimberley are well versed:

'...they're certainly well informed on the importance of it [bioprospecting] and the importance and relevance of their traditional knowledge.'

In addition to indigenous peoples being varyingly informed about different aspects of bioprospecting, presenters also identified different groups and individuals within the same group of indigenous people as holding varying levels of knowledge about bioprospecting. For example, Celerina Balucan, a researcher and lecturer at Lordes College in the Philippines, alluded to variation of bioprospecting knowledge

between the indigenous tribes of the Philippines through describing the awareness of bioprospecting that one particular Filipino tribe had demonstrated (by taking actions to protect their resources against biopiracy) whilst commenting that she was 'not sure' about a more general level of awareness of bioprospecting amongst the broader indigenous Filipino community.

In a similar vein, Inotoli Zhimomi indicated that whilst many Nagas were not well informed about bioprospecting, the 'Naga intellectuals and activists' had a considerably better understanding of this subject.

Related issues

Other experts did not provide any direct statement on how well informed they believed a particular group of indigenous peoples were about bioprospecting, but instead considered issues surrounding this topic.

Anne Waters, an academic from California State University, discussed an obligation placed by the western world on indigenous nations, to 'share whatever they know', and commented that not enough information is provided to indigenous peoples about why and how their knowledge is used by outsiders. 'Those kinds of questions', she stated 'need to be clarified before an honest, respectful dialogue can occur.'

The interview question was seen to relate to issues of self-governance of indigenous peoples by Ikechi Maduka Mgbeoji, an intellectual property lawyer from Nigeria. He believed that the indigenous peoples of Nigeria were 'to a large extent, better off than indigenous peoples elsewhere' because they have 'had the time to govern their own affairs', whereas many others 'have not had the power to determine for themselves where they will go'.

Another topic addressed by two experts was the challenge faced by indigenous peoples in understanding bioprospecting due to its relatively recent arrival in their communities and its foreignness to their cultures. Inotoli Zhimomi addressed the Naga's difficulty in 'suddenly having to defend themselves' against 'being attacked by this western technology of prospecting'. She implied that indigenous peoples are excluded from both decision-making on bioprospecting laws - which, she stated

'have been constructed somewhere far away in the Western world' - and from being informed about what others have decided:

... 'what is happening in the law firms or [at] the diplomatic tables or inside these air-conditioned places [in regards to bioprospecting decision-making] is not known...'

A similar opinion was expressed by Bevan Cassady, a Nwyaigi warrior and academic at Macquarie University. Bevan highlighted the current distance between indigenous peoples and bioprospecting - 'developed from university institutions' - but proposed that modification of present academic frameworks could result in 'a bothways bioprospecting of knowledge'.

Importance of communicating information from the* Indigenous Knowledge and Bioprospecting *conference to indigenous communities

Summary

All fourteen experts interviewed believed that it was important to communicate information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities. Many respondents also indicated how important they considered such communications to be. Discussions were not restricted to matters concerned with the dissemination of information from this particular conference, but often included exploration of much broader issues. Each respondent identified at least one reason to share information from the *Indigenous Knowledge and Bioprospecting* conference with indigenous peoples. These were associated with the assets of this particular conference, the obligation to communicate, and the benefits of communication. The advantages of providing information from the conference to audiences other than indigenous communities were also mentioned.

Experts' responses to this question are presented below, and organised according to the following themes:

- Degrees of importance
- Assets of the *Indigenous Knowledge and Bioprospecting* conference
- Obligation to communicate

- Benefits of communication

Degrees of importance

In addition to stating that they believed it is important to communicate information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities, many respondents also described *how important* they considered this undertaking to be.

The opinion of Ikechi Maduka Mgbeoji (intellectual property lawyer originally from Nigeria) on this matter was explicitly expressed. Ikechi firmly asserted a belief that the sharing of information from the conference with indigenous communities was a matter of high priority:

'It is very, very important that they find out. It is very important that they find out. Let no one be mistaken about that.'

A similar degree of importance was ascribed to the communication of information from the conference to indigenous peoples by other presenters. Manuka Henare, a Maori lecturer at the University of Auckland Business School, stated that the conference organiser's plans to make information from the *Indigenous Knowledge and Bioprospecting* conference available to indigenous communities had significantly influenced his decision to attend the event:

'Well, I wouldn't have accepted the invitation if that wasn't in the program.'

Indeed the purpose of the conference was considered by Bevan Koopman, a research scientist at the Co-operative Research Centre for Enterprise Distributed Systems Technology, to be defeated if its outcomes were not shared with indigenous peoples:

'I think there's no point...[in] having these discussions about things that affect indigenous people if you don't include them in...the results that come out of it.'

Such communication was thought by Michael Davis, a freelance consultant working for the protection of indigenous knowledge in Australia, to be essential. Michael

viewed the communication of information from conferences focused on indigenous affairs with indigenous communities as a necessity undertaken too infrequently:

'I think it's absolutely critical and I think it doesn't happen nearly enough.'

A number of presenters did not directly state their opinions on how important they believed the communication of information from the conference to indigenous communities to be. Nevertheless, phrases used by some of these presenters to confirm they believed these communications were important - such as 'Yes, yes - very much' (Jerzy Koopman), 'Absolutely, absolutely' (Bevan Koopman) and 'Definitely' (Kim Courtenay) - suggest that they too ascribed a relatively high level of importance to this matter.

Assets of the Indigenous Knowledge and Bioprospecting *conference*

Whilst all presenters supported the idea of communicating information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities, few explained why such an undertaking was important in terms of the merits of this particular conference. However, in two cases, the diversity of perspectives represented at the *Indigenous Knowledge and Bioprospecting* conference was seen as the major asset of this event as an information source for indigenous communities. Kim Courtenay (horticulture academic in Western Australia) believed that 'a whole cross section of thought' had been successfully presented at the conference, and Jerzy Koopman (intellectual property lawyer from the Netherlands) appreciated that the conference had included 'such a diversity of peoples and a large representation of indigenous communities and also people from such different worlds and different cultures', whose messages 'could be worth to take into account ...for many communities in the world.'

The value of information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities was also seen to lie in its being up-to-date. Inotoli Zhimomi (scholar from Nagaland) implied that such information might prove useful to indigenous communities attempting to keep up with rapidly evolving bioprospecting legislation and issues:

'all the [bioprospecting] knowledges keep moving and transforming and developing and the laws also keep going and moving'...

Obligation to communicate

Amongst the reasons presented by experts for sharing information from the 2004 Sydney *Indigenous Knowledge and Bioprospecting* conference with indigenous communities was the argument that such communications are an obligation.

This reasoning was employed by Michael Davis (freelance consultant), who believed that it was essential to communicate to indigenous peoples, information from conferences which focus on indigenous issues. He explained that such forums often inhibit indigenous peoples' participation by being held in physical environments and carried out in languages that are unfriendly to indigenous peoples, who subsequently are less fully involved in the discussions at these events than their best interests dictate. Thus, reasoned Michael, there is a need for both 'more accessibility for indigenous peoples at these kinds of conferences' and for indigenous peoples to 'at least get the information from the conferences'.

Celerina Balucan (Filipino researcher) also believed that there exists an obligation to communicate information from discussions about indigenous concerns to indigenous peoples. She stressed indigenous peoples' 'right to know' the results of the *Indigenous Knowledge and Bioprospecting* conference, which had been 'all about their culture, their knowledge and the biological diversity... in [their] environments'.

Benefits of communication

Many of the reasons presented by respondents for communicating information from the *Indigenous Knowledge and Bioprospecting* conference to indigenous communities focused on the benefits it was believed such communications would yield.

Jerzy Koopman (Dutch intellectual property lawyer) expressed a belief that 'inspiring' messages from the conference 'may give some communities hope' and Celerina Balucan (Filipino researcher) was one of a number of presenters to indicate

that indigenous communities receiving information from the conference may benefit by feeling more connected to other communities in regards to bioprospecting issues. She considered that the major advantage for indigenous communities in receiving information from the conference would be awareness that other groups understand the challenges they face in relation to bioprospecting:

'...they will know the people around them are also concerned about their plight.'

The connection of indigenous communities through their receiving information from the conference would provide an important opportunity for them to learn from each other, stated Anne Waters (lawyer, academic and writer from the United States). She explained that those communities concerned about protecting their resources from bioprospecting could learn from the successes of other indigenous communities on this front:

'When indigenous peoples do not have the ability to control their own resources from theft and piracy of colonial regimes, then they need to begin reaching out and sharing with other indigenous people around the world to find out which ones have been successful in maintaining self determination and some control over their resources and how that can be done. It's very important to find that out.'

Marcelin Tonye Mahop (intellectual property scholar originally from Cameroon) also believed that sharing information from the conference with indigenous communities presented them with an important learning opportunity:

'It is going to allow them to learn about these things. They really need to learn what is happening in other parts of the world - at this conference and at other discussions. These events provide valuable information for them to tap into.'

Similarly, Ikechi Maduka Mgbeoji (intellectual property lawyer originally from Nigeria) considered information from the *Indigenous Knowledge and Bioprospecting* conference to be valuable for empowering indigenous peoples to tackle bioprospecting issues:

'I think that information is power. If you are not informed, you are less empowered.'

Manuka Henare (Maori senior business academic) agreed that the provision of information from the conference to indigenous peoples around the world would play an important role in facilitating their education and empowerment in relation to bioprospecting. Furthermore, he explained how these outcomes might influence the opportunities open to indigenous peoples in the international business community:

'[Bioprospecting] is a new issue on the block and the more that Indigenous communities know about it, can understand it, the more we could possibly work together on it in developing common policy approaches in our respective countries...From a business point of view, I'm interested in developing a global indigenous people's economy so we can start buying goods and services from other Indigenous communities around the world...There is a wonderful global market there and it's an indigenous one.'

The desirability of indigenous peoples' empowerment at an international level was a topic also considered by James West (economics professor from the United States). James highlighted the need for indigenous leadership in the world and for 'more full participation' of indigenous peoples in decision making on matters not only of local but global significance:

'Their [the indigenous] voice needs to be added more fully to the consultation.... They [indigenous peoples] need to be given that opportunity for leadership to participate in the discussions and in the dialogue.'

The importance of communicating information from the conference to audiences other than indigenous peoples was also discussed by two presenters. Inotoli Zhimomi (Naga scholar) highlighted the value of communicating outcomes of the conference to the international community at large, particularly so that the stance of indigenous peoples around the world who oppose bioprospecting might be known:

'I think it's good to let the community around the world know [about] some of the conversation that we have brought up, and especially [about] the indigenous voice – that we said "No [to bioprospecting]. This is wrong."

Similarly, the importance of communicating information from the conference to those involved in developing bioprospecting policies was addressed by Bevan Cassady (indigenous Australian academic):

'...it is important... that what we've shared throughout the conference [is] given to educate, challenge, direct and guide those who sit in the corridors of politics and influence to allow not only for ... indigenous peoples' cultural survival but for ...the world's cultural survival and existence.'

Likely effectiveness of a DVD documentary about the* Indigenous Knowledge and Bioprospecting *conference as a tool for communicating bioprospecting information from this event to indigenous communities

Summary

Nine presenters considered this question and all were in favour of making a DVD documentary about the conference available to indigenous communities, although the project was viewed with varying degrees of enthusiasm. Most respondents believed the effectiveness of the DVD project would be compromised by certain factors, the most significant of which was seen to be indigenous communities' inaccessibility to DVD technology. Issues surrounding the acceptance of new technologies by indigenous communities were also discussed and one expert expressed a concern that the content of the DVD might be difficult for indigenous communities to fully understand. The visual nature of a DVD documentary was regarded as favourable for providing information to indigenous peoples, and the methods for communicating information from the conference to indigenous communities that were suggested as alternatives to the DVD documentary were based upon the oral transmission of information to indigenous peoples by persons known within the communities.

Thus, experts' responses to this question have been organised according to the following themes:

- Degrees of support
- Limitations of this tool
- Assets of this tool
- Suggested alternatives

Degrees of support

Support for the DVD was most enthusiastically expressed with the comments 'very wonderful', (Celerina Balucan), 'I think it's great' (Kim Courtenay), 'a good idea' (Inotoli Zhimomi, Marcelin Tonye Mahop), a 'good way to go' (Michael Davis) and 'helpful' (Lindsay Mell). However, some respondents simply favoured use of the DVD documentary over not communicating any information from the conference to indigenous communities. For example, Ikechi Maduka Mgbeoji (intellectual property lawyer) evaluated the DVD documentary as 'better than nothing' because he supported doing 'anything that can be done to make them [indigenous peoples] aware [about bioprospecting]' but held concerns that this particular communication tool would be inaccessible to 'a lot of indigenous people.'

Limitations of this tool

Inaccessibility of the DVD documentary to a proportion of its intended audience was an issue addressed by many other presenters. They believed that many indigenous communities would be unable to view the DVD due to their lack of access to the technology required for its screening (Ikechi Maduka Mgbeoji, Michael Davis, Inotoli Zhimomi, Marcelin Tonye Mahop, Errol Douwes). DVD drives, television, computers and electricity were identified as DVD-related technology likely to be absent from many indigenous communities around the world (Inotoli Zhimomi, Marcelin Tonye Mahop).

Consideration of particular indigenous communities with which they were familiar - and the access these communities had to various levels of technology - formed the basis of some presenters' responses. For instance, Inotoli Zhimomi (Naga scholar) said she was bearing in mind communities in Nagaland when she stated that she thought DVDs were inaccessible to people who live in rural areas:

'I'm just thinking of my village people... How are they going to get this message? There's no TV and electricity hardly comes and so...[the people] haven't got technology to listen to it or to see it [the DVD] so I think there's...practical difficulties.'

Similarly, Michael Davis (freelance consultant) referred to the inaccessibility to technology that was likely to apply to some indigenous communities in Australia with which he was familiar:

'I know obviously a lot of remote communities, certainly within Australia...may not have access to DVDs and remote technology.'

In contrast, Kim Courtenay (horticulture academic) did not perceive such a barrier:

'I think that modern methods of communication are just making all that sort of stuff [communicating with indigenous communities] a lot easier.'

Manuka Henare (Maori senior business academic) was also 'pro technology'. He encouraged use of the DVD documentary as planned and did not mention any factors which might limit its effectiveness:

'I'm pretty much open to using the technology 'cause you'll never know if it's any good unless you try it out.'

Manuka was also one of two presenters to address the issue of indigenous peoples' acceptance of DVD technology in considering the likely effectiveness of the DVD documentary. He referred to the embracing of DVD technology by young Polynesian peoples:

'All I know is, among the young people - young Polynesians - DVDs are the latest technology. So our young people tell us. They're not afraid of the technology, for all its risks and dangers.'

Lindsay Mell (President of the United Nations Association in NSW) also considered the topic of indigenous peoples' acceptance of DVD-related technology. Lindsay referred to the 'intrusion' of technology into indigenous communities and to a 'transition of...acceptance of technology' which he thought to be relatively pronounced in indigenous communities and which he presumably believed would act to inhibit effectiveness of the DVD documentary.

Whether indigenous communities viewing the DVD documentary were likely to face difficulties in understanding its content was an issue touched upon by only one presenter. Errol Douwes (South African PhD scholar) implied that indigenous communities might be challenged to comprehend the entire documentary due to the complexity of much of the information that had been covered in presentations at the conference:

'It's hard to say whether they'll... be able to understand everything that's been said here.'

Assets of this tool

One aspect of the DVD documentary considered to potentially work in its favour in communicating information to indigenous communities was its visual nature. Michael Davis (consultant working to protect indigenous knowledge) extolled the value of communicating information visually to indigenous peoples for education purposes:

'...visual information is a very powerful tool for raising awareness and education'

For Celerina Balucan (Filipino researcher) the value of communicating via visual media to indigenous communities lay in the fact that 'not all indigenous peoples could read'. She indicated that much information could be gained by indigenous peoples, from communication artefacts which could be 'seen like a TV.'

Suggested alternatives

For communicating such information from the conference, the likely effectiveness of the DVD documentary - relative to other methods of communication - was a topic

addressed by a few respondents. Marcelin Tonye Mahop (intellectual property lawyer from Cameroon) suggested that 'other means of communication may be more useful or more appropriate' for indigenous peoples but he did not specify which methods might better fulfil the intended role of the DVD documentary.

A number of potentially 'helpful' methods for disseminating information from the conference to indigenous communities were identified by Manuka Henare (Maori business academic), although he did not indicate the conditions under which each could be considered helpful:

'...use any method that's helpful to distribute information, whether it's on a piece of paper, a book, someone speaking orally...[or], these days, DVD.'

Two presenters identified more clearly, a method of communication which they believed would prove superior to the DVD documentary for providing information to indigenous peoples from the conference. In both cases, oral communication of such information by persons known within indigenous communities was the alternative presented. Errol Douwes (South African PhD scholar) suggested this role might be filled by someone who has a 'working relationship' with the community, who could 'take some messages back' to the people. A very similar opinion was expressed by Inotoli Zhimomi (Naga scholar) who saw the 'communicator' as someone belonging to the community. She referred to the circumstances of her own community by way of example:

'...my people have got me and I could...do that transmission through the oral tradition. You know...these kinds of stories can be transmitted...to the people who can't have access to this [DVD related] technology'.

The findings presented in this chapter are discussed in the next and final chapter of this sub-thesis.

CHAPTER 5 - DISCUSSION

Overview

Bioprospecting is an important life-science industry to which indigenous communities can valuably contribute. This study was conducted to gain insights into the communication of bioprospecting information to indigenous communities by benefiting from the specialised knowledge of experts in the field of bioprospecting and indigenous people. These experts were presenters at the 2004 Sydney international *Indigenous Knowledge and Bioprospecting* conference, who were asked for their perspectives on:

- how well informed particular groups of indigenous peoples are about bioprospecting,
- the importance of communicating information from the 2004 international *Indigenous Knowledge and Bioprospecting* forum to indigenous communities, and
- the likely effectiveness of a DVD documentary as a tool for communicating bioprospecting information from the *Indigenous Knowledge and Bioprospecting* forum to indigenous communities.

The major findings were:

- Only one expert made a definitive statement about how well informed a particular group of indigenous peoples were about bioprospecting; they were seen to be poorly informed on this topic. References were made to variation in bioprospecting knowledge between different tribes and between individuals within the same group of indigenous peoples. Numerous groups of indigenous peoples were considered to be varyingly informed on different aspects of the broad bioprospecting topic, being least knowledgeable about the legal, economic and technical aspects of bioprospecting. Related issues discussed included the difficulties faced by indigenous peoples in becoming familiar with an enterprise so suddenly arrived in their communities and so alien to their cultures.
- All experts believed that it was important to communicate information from the *Indigenous Knowledge and Bioprospecting* forum to indigenous

communities. Reasons to share information from the conference with indigenous peoples identified by experts were associated with the assets of this particular event, the obligation to communicate, and the benefits of communicating. Disseminating information from the conference to broader society was also encouraged.

- Experts unanimously supported making a DVD documentary about the conference available to indigenous communities. However, it was believed that effectiveness of the DVD project would be limited by certain factors, including inaccessibility to and lack of acceptance of DVD technology in indigenous communities, and complexity of the content of the DVD. The visual nature of the DVD documentary was seen to work in its favour as a tool for communicating with indigenous peoples. Suggested alternative methods for communicating information from the conference to indigenous communities were based on the oral transmission of information to indigenous peoples by persons trusted by the communities.

Conclusions and recommendations

Bioprospecting awareness amongst the indigenous peoples with whom experts are familiar

Only one expert made a definitive statement about how well informed a group of indigenous peoples were about bioprospecting; the Cameroonian expert believed that the indigenous peoples of Cameroon have poor knowledge of bioprospecting. Comparing this finding with those of previous studies is made difficult by a lack of research on the bioprospecting awareness of particular indigenous peoples; the most closely related findings appear in reports such as the New Zealand Biodiversity Strategy (n.d.), in which poor awareness about biodiversity conservation issues was found amongst communities in New Zealand. This suggests that calls for bioprospecting awareness-raising amongst indigenous peoples in the literature (see Sharing the Benefits, 2003; Janke, 1998; Greer & Harvey, 2004) have resulted from indigenous peoples' requests for more bioprospecting information and from observations that there has not been full and effective indigenous participation in bioprospecting discussions, rather than research amongst communities.

Bioprospecting awareness was seen to be low amongst the indigenous peoples of Cameroon because the people only see need for gaining bioprospecting knowledge when approached by bioprospectors requesting their involvement in projects, which has presumably not been a frequent occurrence. McCrindle (2002) has pointed out that adult learning occurs on a 'need-to-know' basis, and the declaration of the Cameroonian expert in this study that an 'issue of awareness raising' surrounds the poor bioprospecting awareness of Cameroon's indigenous peoples indicates his belief that even if a need to know about bioprospecting does not exist amongst these peoples today, it is likely to in the future. The only reasonable recommendation that can derive from this finding is that more in-depth research be conducted into the bioprospecting knowledge of groups of indigenous peoples who are seen to be poorly informed about bioprospecting, so that this information can be combined with biogeographical data to reveal which populations have real and urgent information needs in relation to bioprospecting and how these needs might best be met.

In retrospect, the fact that most presenters did not clearly state how well informed about bioprospecting they believed a particular group of indigenous peoples are is not wholly surprising. Summarising the variation in bioprospecting awareness that is likely to exist between communities and individuals within an indigenous group due to differences in political, economic, social and cultural factors would have presented a great challenge. Indeed, it was implied by the experts that inter-tribal variation in bioprospecting awareness existed in the Philippines, and differences in the knowledge of individuals within the same community existed in Nagaland. Additionally, it is conceivable that presenters also feared being held accountable for passing what others may consider to be an inaccurate judgement about the knowledge of particular indigenous groups. Such a concern may have been felt especially keenly by the experts interviewed for this research, who were confronted with a note-taking, video-recording researcher.

Three experts believed that the indigenous peoples they were considering were varyingly informed about different subject areas within the broad topic of bioprospecting. These peoples were thought to be particularly poorly informed about the legal, economic and 'technical' aspects of bioprospecting, with the latter

category presumably including the scientific processes of this industry. Previously, authors have recommended that information be provided to indigenous peoples on these very aspects of bioprospecting, including the international treaties and conventions affecting bioprospecting (Janke, 1998; Fundacion Sociedades Sustentables (n.d.), legal issues surrounding access to genetic resources and the protection of indigenous knowledge (Fundacion Sociedades Sustentables (n.d.) and scientific information related to biodiversity use (Greer & Harvey, 2004). The fact that this study has shown that the same subject areas are still poorly understood by some indigenous peoples reinforces the need to make them the focal subjects for future bioprospecting awareness raising programs.

It can be inferred from the comments of two experts who highlighted the foreignness of bioprospecting to indigenous cultures and the fact that decision-making on this industry is non-indigenous controlled, that they thought it unreasonable to expect bioprospecting awareness amongst indigenous communities. Certainly, the idea that many aspects of modern bioprospecting are completely strange to indigenous cultures is not new, and Takeshita (2000, p. 558) discussed how a number of the concepts and practices central to bioprospecting are alien to indigenous cultures. Similarly, the observation that Western interests have dominated processes of decision-making on bioprospecting matters that affect indigenous peoples is well supported in the literature (Takeshita, 2000, p. 561; Dutfield, 2000). These experts' remarks then serve as a reminder that since indigenous peoples have generally had little opportunity to become familiar with modern, Western bioprospecting, inquiries after their knowledge of this industry may be considered somewhat inappropriate by some.

Extrapolating what level of bioprospecting awareness is likely to exist amongst indigenous peoples worldwide from the findings of this study is, unfortunately, not feasible. The relatively small number of groups of indigenous peoples considered in this research, plus with the great diversity that exists between indigenous peoples worldwide render attempts to draw meaningful conclusions on this matter here futile. Nevertheless, this study has highlighted that concern about indigenous peoples' bioprospecting awareness exists amongst international experts on these issues in 2004. Rather than using this information to urge the undertaking of a

larger investigation into the bioprospecting knowledge of the world's indigenous peoples collectively, it is more constructive to encourage detailed studies into the bioprospecting information needs of indigenous peoples within particular geographic regions to assist in the tailoring of awareness raising programs to meet the needs of the people in these areas.

Importance of communicating information from the* Indigenous Knowledge and Bioprospecting *forum to indigenous communities

Experts unanimously believed it is important to communicate information from the conference to indigenous communities. The need for more bioprospecting information to be provided to indigenous communities has often been recognised (Swiderska, 2001; Laird, 2002, p. 191; Greer & Harvey, 2004), but experts' recent reinforcement of the value of such communication lends critical support to the conference organisers' decision to invest time, energy and resources into sharing information from the *Indigenous Knowledge and Bioprospecting* forum with indigenous communities. Additionally, the fact that some experts expressed that such information-sharing was the reason they attended the conference and was what made the event worthwhile can reveal to the organisers of future international bioprospecting fora that their participants are likely to view the dissemination of information to indigenous communities as critically important, if not essential.

It is clear from their responses that many experts considered the question of how important it is to communicate general bioprospecting information - rather than that specific to the *Indigenous Knowledge and Bioprospecting* conference - to communities. This is indicative of the importance and current topical nature of the larger communications issue. Despite authors of previous studies having articulated similar views, it must be remembered that because presenters at the *Indigenous Knowledge and Bioprospecting* conference were current specialists in the rapidly changing field of bioprospecting and indigenous peoples, their comments were expected to both carry particularly great weight and provide up-to-date insights into the matters raised. Thus, the conclusion to be drawn from the fact that these experts considered the communication of bioprospecting information - regardless of its source - to indigenous communities to be very important is that such information-sharing remained an issue of key international importance in 2004.

Experts who considered the importance of communicating information specifically from the *Indigenous Knowledge and Bioprospecting* conference to communities believed that two particular aspects of this event would contribute to its value as such an information source. The first was diversity - amongst speakers at the conference and the information and perspectives they shared - which organisers of the forum had strived to ensure. High indigenous, developing country and female representation had been encouraged by the forum's organisers and it was intended that a broad range of subjects and issues related to the event's theme would be discussed (C. Jones, personal communication, 19 February 2004; C. Jones, personal communication, 16 June 2004). Experts' indication that bioprospecting information may be of greater value to indigenous communities if it contains representation of diverse groups, issues and perspectives is certainly worth considering when planning bioprospecting communications initiatives in the future.

The up-to-date nature of the Sydney forum was also identified as an asset of this event as an information source. One expert asserted that the information and legislation surrounding bioprospecting are constantly changing, and alluded to the difficulty faced by indigenous peoples in keeping abreast of these developments. Her observation is well supported in the literature; ten Kate (1995, p. 2) stated that the rules relating to access to biodiversity alone 'are frequently unclear, inconsistent and change constantly' and reference to 'rapid' and 'frequent' changes in regulations affecting the use of indigenous knowledge in bioprospecting was made in Call to Dialogue (2000). Thus, the expected benefits of communicating to indigenous communities, information from an event at which the most recent scientific, legal and political developments in bioprospecting have been discussed are clear, and the importance of distributing information from the 2004 conference to these communities - and doing so in a timely manner - is reinforced.

An obligation to undertake such communications was recognized by two presenters. If such information-sharing can be regarded as an effort to promote indigenous peoples' participation in the conference, then the concept that there exists an obligation to undertake it is well supported in the literature, although authors have most often referred to indigenous peoples' right to fully participate in *decision-*

making on matters that affect them (Borraz, n.d.). The idea that information from international fora relevant to indigenous peoples should be made accessible to them raises a multitude of difficult questions, including 'whose obligation is it to make the information accessible?', 'how should 'accessible' be defined?' and 'what information should be provided and in which languages?'. Whilst it is likely that corresponding one-size-fits-all solutions will never be developed, discussion on these points could lead to the development of minimum standards concerning the sharing of information from international fora addressing indigenous issues.

It is also important to consider one expert's suggestion that disseminating information from discussions concerning indigenous peoples is less important than improving indigenous attendance at these events. The use of inappropriate venues and languages was seen by this expert as inhibitory to indigenous participation in such consultations, and whilst forum venues are seemingly neglected as a topic in the literature, it has been strongly argued that meetings and consultations addressing indigenous issues use languages that allow more indigenous involvement than just 'global languages like English and French', and that awareness raising in indigenous communities occurs in the peoples' own languages (Gupta, 2001; Alonso, 2003; Erdos, 1998). Using more indigenous-friendly venues and languages could thus improve indigenous attendance of and participation in bioprospecting discussions, and such direct involvement should logically be prioritised over sharing information from these events upon their conclusion.

Nevertheless, communicating information from the *Indigenous Knowledge and Bioprospecting* conference to communities was expected by experts to yield a range of important benefits. The most basic of these was hope for communities, which was also an outcome desired by conference organisers, who had expressed that sharing information from the event could 'generate an optimism in the community level to respond to [bioprospecting] issues in a positive way' (C. Jones, personal communication, 5 May 2004). Within the literature, heightened positive feelings - such as pride and confidence - amongst indigenous peoples have been associated with communities becoming more aware of the value of their own knowledge and biological resources (Shanley, 1996, p. 18; Gupta, 2001; Lawrence & Ambrose-Oji, 2001). Consequently, it may prove valuable to ensure that bioprospecting

information distributed to indigenous communities in the future emphasises the scientific and commercial value of the peoples' biological resources and biodiversity knowledge.

Similarly, it was believed that indigenous communities receiving information from the *Indigenous Knowledge and Bioprospecting* forum would benefit from knowing that other people around the world were concerned about their plight in regards to bioprospecting. The expectation that feelings of 'fellowship' or solidarity amongst indigenous peoples would result from sharing information from the Sydney conference was also held by the event's organisers (Jones, 2003). It is fair to say that from the perspective of a Western participant at the conference, particularly strong bonds did seem to form between the forum's indigenous participants who, for example, addressed one another as 'brother' and 'sister'. Perhaps then, there is good reason to suppose that as predicted, feelings of solidarity and unity amongst indigenous peoples could be transferred via communications from the Sydney conference - and other sources to which indigenous perspectives have been contributed - to indigenous communities.

The opportunity for indigenous communities to learn from the bioprospecting experiences of other communities was another benefit expected to result from sharing information from the conference. In particular, it was believed by one expert that much could be learned from those communities who had managed to successfully control or prevent bioprospecting within their territories. It is true that a number of presentations at the conference focused on the bioprospecting experiences of particular indigenous communities and peoples - including the Jawoyn, Maori and Naga people, and groups in the Philippines and the Americas - and these could offer valuable information to communities facing similar issues. 'Horizontal' learning between communities on biodiversity and indigenous knowledge issues has been deemed important in previous studies (see Participation and Indigenous People, 1996; New Zealand Biodiversity Strategy, n.d.; Gupta, 2001) and would very likely be facilitated by the sharing of information from fora with high indigenous participation, such as the event in Sydney.

It was also believed by experts that information from the Sydney conference could allow indigenous communities to learn not only from other communities, but 'what is happening in other parts of the world'. This, they argued, could help to empower indigenous communities and build their capacity to achieve more just outcomes from bioprospecting negotiations and drive bioprospecting-related markets. Certainly, communicating bioprospecting information to indigenous communities has frequently been linked to improved capacity of communities to fully participate in the development of bioprospecting legislation and contract negotiations, and authors have also speculated about the establishment of community-driven bioprospecting ventures (Sharing the benefits, 2003; Moran, 2000, p. 142; Erdos, 1998). Indigenous peoples' successes in achieving their own self-determined goals in respect to bioprospecting will no doubt depend, as indicated by the experts, on their receiving information about bioprospecting in a global context.

Communicating information from the *Indigenous Knowledge and Bioprospecting* forum to the wider society - and not just indigenous audiences - was also thought to be important by two experts, although they provided very different supporting arguments. One stressed the importance of sharing information from the event to 'to educate, challenge direct and guide those who sit in the corridors of politics and influence', whilst the other expressed a desire to widely communicate that indigenous peoples have 'said "No" to bioprospecting'. Whilst not devaluing indigenous peoples' right to say "No" to bioprospecting (Bioprospecting/Biopiracy, 1994), it must be pointed out that the priority of future bioprospecting communications initiatives is likely to be to raise awareness about this industry, rather than convey messages about its acceptance by particular groups, and it will be critical that widely disseminated bioprospecting information be neutral and objective so that recipients can choose paths that enhance their own development goals (State of the World's Forests, 2003; Rosenthal, 2003).

Likely effectiveness of a DVD documentary about the* Indigenous Knowledge and Bioprospecting *forum as a tool for communicating bioprospecting information from this event to indigenous communities

All experts considering this topic supported the idea of providing a DVD documentary about the conference to indigenous communities. However, given that

most presenters also identified at least one way in which they thought the effectiveness of this project would be compromised, it seems likely that many experts supported the project simply in preference to not sharing information from the conference with communities at all. Given that the audio-visual material for the conference documentary was collected before the interviews for this study were completed, and that production of the documentary was under-way before the findings of this study were revealed, insights gained from experts' responses to this question will not be presented to the documentary's producers to affect change of this project, but as recommendations for future, similar communications efforts.

Lack of access to DVD related technology was the factor that experts most frequently cited as likely to work against this tool's effectiveness. Whilst some presenters referred to low levels of technology in the indigenous communities with which they were familiar, others considered the technology likely to be available to indigenous communities around the world and expressed concerns that at least a proportion of these would not have the capacity to view DVDs. Certainly, 'useful, new technology' is particularly unavailable to indigenous communities in rural areas of developing countries (State of the World's Forests, 2003), although Alonso (2003) emphasised the great importance of indigenous media such as radio, television and videos within many communities. Variation in technology available to indigenous communities is clearly near impossible to factor into the dissemination of information on a global scale. However, new technology has been recognised as a powerful tool for sharing information with indigenous communities - particularly when used in combination with traditional forms of communication - and is expected to play an important role in future bioprospecting communications (Alonso, 2003; State of the World's Forests, 2003).

Closely related to the question of accessibility of new technologies is the issue of their acceptance by indigenous communities, which was also raised by the experts in this study. One presenter commented that DVD technology was well accepted amongst the indigenous peoples with whom he was familiar, and so fully supported its use. However, another expressed concern that acceptance of such technology may not be so widespread in indigenous communities, which could limit effectiveness of the DVD documentary. Meyer (2002) explained that acceptance of

information by indigenous communities is facilitated when communications mechanisms with which the target group is familiar are used. Thus, the lesson for the future providers of bioprospecting information to communities is to determine what methods of communication are preferred by the target audience before deciding which media to use in their projects.

Another aspect of the DVD documentary about which experts were concerned was the complexity of its contents, as it was questioned whether the target audience would fully understand the information presented. So that such a comment is not misinterpreted as a slight upon indigenous peoples, it should be pointed out that authors of bioprospecting studies have determinedly attempted to convey the extraordinary complexity of bioprospecting issues (Day-Rubenstein and Frisvold, 2001; ten Kate 1995, p. 2) and it has been remarked that some aspects of bioprospecting are 'at least as complicated technically, politically and ethically as is biomedical research with human subjects' (Rosenthal, 2003). Means of making complex information more digestible to lay audiences include simplifying and breaking down information into small pieces that can be assimilated, and passing on only a few new concepts at a time (Swiderska, 2001; McCrindle, 2002) - methods which would presumably prove valuable in the communication of complex bioprospecting information to communities.

Working in favour of the DVD documentary as a communication tool was its visual nature, according to two experts. Visual forms of communication - including body language, dances, demonstrations, and painted and printed images - are well known to be important in indigenous knowledge systems, which involve the use of remarkably sharp observation abilities (Meyer, 2002). The importance of including visual information when sharing information cross-culturally with indigenous communities has been frequently acknowledged (McCrindle, 2002; Alonso, 2003; Meyer, 2002), and in the case of the DVD documentary, body language - which plays an important role in adding meaning within particular situations (Meyer, 2002) - would be expected to facilitate the communication of messages expressed orally by presenters. In providing both audio and visual information to its viewers, the DVD documentary offers advantages over many other media and this type of tool should

be considered potentially valuable for sharing bioprospecting information with communities.

The two alternative methods of communicating information from the conference to communities that were suggested by experts both involve the oral transmission of information from the event by a person trusted by the community. This idea is very consistent with the literature; it is well accepted that indigenous cultures have an oral tradition (McCrindle, 2002; Erdos, 1998; Alsonso, 2003), and face-to-face communication is probably the most important way of transferring information within indigenous communities (Meyer, 2002). It is also well known that people are more likely to accept information from someone they trust, and a trusting relationship between the providers of information and its potential users in indigenous communities is considered essential (Participation and indigenous Peoples, 1996; Meyer, 2002; Emery, 2002). It follows then, that face-to-face contact between communicators - who should be known to and trusted by the community - and indigenous community members should be maximised in future bioprospecting awareness-rasing programs.

Thus, the recommendations of this study are to:

1. Communicate relevant bioprospecting information from international conferences - and other useful sources - to indigenous communities, but prioritise increasing indigenous attendance at these events by using venues and languages that are conducive to indigenous participation.
2. Develop minimum standards for sharing information from bioprospecting fora that affect indigenous peoples.
3. Ensure that bioprospecting information provided to indigenous communities: a) meets the information needs of the people in terms of the topics covered, b) presents diverse issues and perspectives, c) emphasises the value of indigenous resources and knowledge to bioprospecting, and d) is appropriately complex in content and in a language understood by the target audience.
4. Combine appropriate new technologies with traditional forms of communication when sharing bioprospecting information with indigenous

communities, using visual media and face to face communication wherever possible.

Limitations

The size and scope of this project were limited so as to define a manageable sub-thesis. Relatively few interviews were conducted and interview questions covered a modest range of issues relevant to the communication of bioprospecting information from a single, although unique and important, international event. Additionally, despite the great weight that the opinions of interviewees - who were experts in bioprospecting and indigenous peoples issues - was seen to carry, it is recognised that the insights gained in this study illuminate only a fraction of the 'big picture' of communicating bioprospecting information to indigenous communities.

Future research

There are numerous possibilities for future research stemming from the findings of this study. In-depth investigations could be carried out amongst those peoples found in this study to have either poor bioprospecting awareness or poor knowledge of particular bioprospecting topics, to assist communicators in tailoring awareness-raising campaigns to these communities' bioprospecting information needs. Assessments of bioprospecting awareness amongst the indigenous communities of a wider range of geographical regions - but especially those rich in biodiversity - could provide information useful for prioritising areas for bioprospecting awareness-raising campaigns. Similarly, investigations into the type of media and tools preferred by target communities for receiving bioprospecting information could contribute to the success of future campaigns, whilst it would also prove rewarding to examine the experiences of communities previously involved in bioprospecting, to learn about the types of bioprospecting information that have been of use to indigenous peoples in real life bioprospecting negotiations and decision-making.

Despite almost two years having passed since the *Indigenous Knowledge and Bioprospecting* conference, consulting with communities which received information from the forum via the DVD documentary or another medium may still yield valuable data. Indeed, investigations carried out at the community level - into the effectiveness of media employed by the conference organisers in communicating

bioprospecting information to communities, and into the value of the received information to the communities - could lead to enhanced future efforts to share relevant information from bioprospecting discussions and consultations with indigenous communities.

Postscript

Since the 2004 *Indigenous Knowledge and Bioprospecting* forum, issues surrounding the use of indigenous peoples' resources and knowledge in bioprospecting have remained topical in the international arena. The following list of recent debates and events demonstrates the importance of these issues - and of communicating information relevant to them - in 2006.

January 2006

Levels of concern amongst the indigenous peoples of the Northern Territory were raised after the Northern Territory government introduced new legislation to regulate biotechnology companies, which would open the door to pharmaceutical companies wanting to find commercially valuable natural resources in the Territory (*Govt unveils new 'bioprospecting' policy*, 2006).

Expert Seminar, *Indigenous Peoples' Sovereignty over Natural Resources and on their Relationship to Land* held in Geneva, Switzerland (Indigenous peoples' sovereignty, 2006).

Native Hawaiians demand that the University of Hawaii relinquish three patents over the native and traditionally sacred taro plant (Elias, 2006).

February 2006

International dialogue, *Environment Canada - Assembly of First Nations Indigenous International Dialogue: Perspectives on Genetic Resources and Traditional Knowledge*, held on the traditional territory of the Tsleil-Waututh Nation in Burrard Inlet, North Vancouver, Canada (Indigenous experts on biodiversity issues, 2006).

Debate was sparked by an article by Namibian biology lecturer, Kazhila Chinsembu (2006), which urged African science to better

control the use of African natural resources and indigenous knowledge by other nations.

March 2006

An *Intellectual Property and Indigenous Peoples* conference, which addressed issues related to the use of indigenous peoples' biodiversity knowledge was held at Rutgers University in New Brunswick (Intellectual Property and Indigenous Peoples, 2006).

Captain Hook Awards for Biopiracy, which recognise extreme and egregious acts of biopiracy, were awarded by the Coalition Against Biopiracy at the eighth Conference of the Parties to the Convention on Biological Diversity in Curitiba, Brazil (Captain Hook Awards for Biopiracy, 2006).

Payment for the use of traditional knowledge was opposed by Via Campesina, the international small farmers' and peasant movement, who rejected it as a means to 'merchandise' indigenous knowledge and exploit its holders, at the eighth Conference of the Parties to the Convention on Biological Diversity in Curitiba, Brazil (Peasants Say 'No' to Selling Traditional Knowledge, 2006).

More than 40 indigenous leaders of potato farming communities in Peru requested agribusiness, Syngenta International, to abandon its patent on terminator technology to control sprouting potatoes, which could 'put at risk' more than 3 000 potato varieties in the region (Disown Patent on "Terminator" Potato, Indigenous Farmers Tell Business Leader, 2006).

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APPENDIX I

THE AUSTRALIAN NATIONAL UNIVERSITY

RESEARCH OFFICE

Ms Yolanda Shave
Secretary, Human Research Ethics Committee

CANBERRA ACT 0200 AUSTRALIA
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FACSIMILE: (02) 6125 4807
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22 October 2004

Ms Sarah Abbott
Centre for the Public Awareness of Science
Faculty of Science
The Australian National University
ACT 0200

Dear Ms Abbott,

Protocol 2004/182
Communicating bioprospecting to Indigenous communities: a case study

On behalf of the Human Research Ethics Committee I am pleased to advise that the above protocol has been approved as per the attached *Outcome of Consideration of Protocol.*

For your information:

1. Under the NHMRC/AVCC *National Statement on Ethical Conduct in Research Involving Humans* we are required to follow up research that we have approved. Once a year (or sooner for short projects) we shall request a brief report on any ethical issues which may have arisen during your research and whether it proceeded according to the plan outlined in the above protocol.
2. Please notify the Committee of any changes to your protocol in the course of your research, and when you complete or cease working on this project.
3. The validity of this current approval is five years' maximum from the date shown on the attached *Outcome of Consideration of Protocol* form. For longer projects you are required to seek renewed approval from the Committee.

Yours sincerely,

Ms Yolanda Shave
Secretary, Human Research Ethics Committee

THE AUSTRALIAN NATIONAL UNIVERSITY

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HUMAN RESEARCH ETHICS COMMITTEE

Outcome of Consideration of Protocol

Researcher: Ms Sarah Abbott
Contact details: Postgraduate Student, Centre for the Public Awareness of Science, Faculty of Science
Protocol No. 2004/182
Title: Communicating bioprospecting to Indigenous communities: a case study
Date on application: 1 June 2004 **Date received in Research Office:** 1 June 2004

On behalf of the Human Research Ethics Committee,

I approve/~~do not~~ approve the above protocol.

Approval is subject to the following conditions:

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Reasons for non-approval: .....

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.....

.....

Review due: .....

Chairperson: ..... **Date:** 21/10/04

(Prof Lawrence Cram)